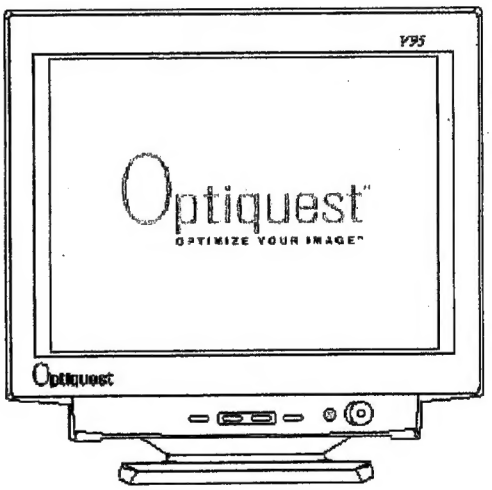
VIDE-V24477

Service Manual

OPTIQUEST V95-2

Model No. VCDTS21475-2

19" Digital Controlled Color Monitor



(Rev. 1 – June 1999)

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Revision History

Revision	Date	Description Of Changes	Approval
1.0	6/1/99	Initial Issue	T. Sears

TABLE OF CONTENTS

WARNING : An electrolytic capacitor installed with the wrong polarity might explode.

Caution : Before servicing instruments covered by this service manual and its supplements, read and follow the Safety Precautions section of this manual.

Note : If unforeseen circumstances create conflict between the following servicing warning and any of the safety precautions, always follow the safety precautions.

1-1-1 General Servicing Warning

1. Servicing warning are printed on the cabinet, and should be followed closely.

2. Always unplug the unit's AC power cord from the AC power source before attempting to : (a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors, (c) connect a test component in parallel with an electrolytic capacitor.

3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.

4. After servicing always check that the screws, components and wiring have been correctly reinstalled. Make sure that the area around the serviced part has not been damaged.

5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples : metal panels and input terminals)

6. Insulation Checking Procedure : Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500V) to the blades of the AC plug.

   The insulation resistance between each blade of the AC plug and accessible conductive parts should be greater than 1 mega ohm.

7. Never defeat any of the +B voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.

8. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead ; always remove the instrument's ground lead last.

1-2 Electrostatically Sensitive Devices (ESD) Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components are commonly called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.

2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.

3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.

4. Use only a grounded-tip soldering iron to solder or desolder ESDs.

5. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESDs.

6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.

7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

Caution : Be sure no power is applied to the chassis or circuit and observe all other safety precautions.

8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.

1-3 Safety Precautions

1-3-1 Warnings

1. For continued safety, do not attempt to modify the circuit board.

2. Disconnect the AC power before servicing.

3. When the chassis is operating, semiconductor heat-sink are potential shock hazards.

1-3-2 Servicing the High Voltage System and CRT

1. When servicing the high voltage system, remove the static charge by connecting a 10k ohm resistor in series with an insulated wire (such as a test probe) between the chassis and the anode lead. (Disconnect the AC line cord from the AC outlet.)

2. Do not lift the CRT by the neck.

3. Handle the CRT only when wearing shatterproof goggles and after completely discharging the high voltage anode.

1-3-3 X-Rays and High Voltage Limits

1. High voltage should always be kept at the rated value, no higher. Be sure all service personnel are aware of the procedures and instructions covering X-rays.
The only potential source of X-rays in current solid state display monitors is the tube. However, the CRT does not emit measurable X-ray radiation if the high voltage is as specified in the fire and shock hazard instruction. Only when high voltage is excessive are X-rays capable of penetrating the shell of the CRT, including the lead in glass material. Operation at high voltages may also cause failure of the CRT or high voltage circuitry.

2. It is essential that service technicians have an accurate high voltage meter available at all times. Check the calibration of this meter periodically.

3. High voltage should always be kept at the rated value, no higher.

4. When the high voltage regulator is operating properly, there is no possibility of an X-ray problem. Test the brightness and use a meter to monitor the high voltage each time a color monitor comes in for service. Make sure the high voltage does not exceed its specified value and that it is regulating correctly.

5. The CRT is especially designed to prohibit X-ray emissions. To ensure continued X-ray protection, replace the CRT with only one that is the same or equivalent type as the original. Carefully reinstall the CRT shields and mounting hardware ; these also provide X-ray protection.

6. When troubleshooting a monitor with excessively high voltage, avoid being unnecessarily close to the monitor. Do not operate the monitor for longer than is necessary to locate the cause of excessive voltage.

1-3-4 Fire and Shock Hazard

Before returning the monitor to the user, perform the following safety checks :

1. Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.

2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators, etc.

3. **Leakage current test :**
The unit was connected to 254V ac, 60Hz. The unit was placed on an insulating surface and all connections to external equipment were disconnected to prevent stray leakage

paths. The leakage current test circuit is shown as Fig.1-1.

4. For Class I equipment, the current between the supply conductors and equipment protective earth terminal was measured using the IEC leakage current meter, described in ANNEX D of UL 1950, Third Edition see table 1. Primary power switches (i.e., "ON/OFF" switches and voltage selector switches) which operated during normal use, were opened and closed in all possible combinations.

5. **Test instrument :**
Simpson mode 1 : 228

1-4-5 Product Safety Notices

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by ⚠ on schematics and parts lists. A substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and / or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

CSA C22.2 No. 950 ◆ UL950

Table 1 Maximum earth leakage current

Class	Type of equipment	Maximum leakage current mA
I	MOVABLE (other than HAND-HELD)	3.5
I	STATIDNARY, PLUGGABLE TYPE A	3.5

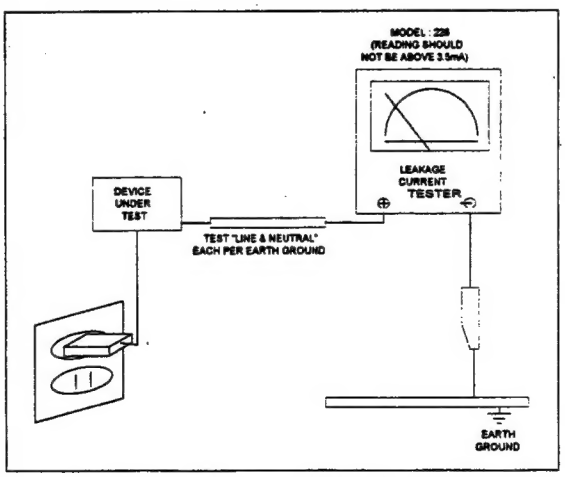


FIGURE1-1. Leakage Current Test CIRCUIT

2. Engineering specification

1.0 SCOPE

1.1 Introduction

This engineering product specification defines and performance requirements for the viewsonic corporation V95-2 family of computer monitors.

1.2 Magnetic Requirements

MODEL NUMBER	LOCATION	MAGNETIC REQUIREMENT
VCDTS21475-2M	NORTH AMERICA	Bh=250mG + - 10 mG, BV=490 + -10 mG

Note : The horizontal magnetic fields listed above are for performance

2.0 GENERAL REQUIREMENT

2.1 General Specification

Unless stated otherwise in this specification, the monitor design and performance shall be as defined in delta engineering design specification and viewsonic specification "VSCEPRSPEC128" , monitor design & performance. The performance of the monitor shall be measured with the equipment and according to the procedures specified in View-Sonic specification "VSC TMTSPEC128" test & measurement.

2.2 Final Assembly

The top level assembly shall consist of a monitor and integral tilt swivel, a power cable, a video cable, a user' guide, an owner's registration / survey card, a service center reference card, a warranty policy statement, and optigreen software.

3.0 NOMINAL CONDITIONS

- AC SOURCE NOMINAL
- ROOM TEMPERATURE 25 DEG C
- 30 MINUTES WARM-UP FOR UNITS
- CRT FACING TO EAST
- INPUT SIGNAL NOMINAL
- VIEWING DISTANCE 45 cm
- AMBIENT LUMINANCE 500 LUX DIFFUSE
- NOMINAL IMAGE BRIGHTNESS 30FLS AT CENTER OF THE SCREEN

4.0 VIDEO INTERFACE CABLE

4.1 Video Cable

The video cable shall be fixed to the monitor and 1.83meters in length.

4.2 Video Cable Connector

The monitor shall be provided with 15pins mini "D" SUB connector for video input.

PIN NO.	SIGNAL
1	RED VIDEO
2	GREEN VIDEO
3	BLUE VIDEO
4	NO PIN
5	NO CONNECTION
6	RED VIDEO RETURN
7	GREEN VIDEO RETURN
8	BLUE VIDEO RETURN
9	NO PIN
10	GROUND
11	NO PIN
12	SDA
13	HORIZONTAL SYNC (COMPOSITE SYNC)
14	VERTICAL SYNC
15	SCL

5.0 VIDEO ELECTRICAL INTERFACE

5.1 DDC (Display Data Channel)

The monitor shall be in compliance with the requirement of **DDC 1/ 2B.**

5.2 Sync

The monitor shall be compatible with separate sync.
The monitor shall be compatible with composite sync.

6.0 FRONT PANEL USER CONTROL

6.1 Digital User Control System

The monitor shall have a front panel control system that is digital with an OSD (On screen display).

6.2 Digital Controls (OSD)

The monitor shall have the following controls :

1. BASIC
   - CONTRAST / BRIGHTNESS
   - HORIZONTAL SIZE / POSITION
   - VERTICAL SIZE / POSITION
   - DEGAUSS
2. GEOMETRY
   - PINCUSHION / BALANCE
   - TRAPEZOID / PARALLEL
   - ROTATION
   - MOIRE (HOR)
3. VIEWMATCH COLOR (9300K, 6500K, 5000K USER COLOR)
4. VIEWMETER
5. OSD FUNCTION
6. LANGUAGE (ENGLISH, FRANCIS, DEUTSCH, ITALIANO, ESPANOL)

7.0 ELECTRICAL REQUIREMENTS

7.1 Horizontal / Vertical Frequency

The monitor shall be capable of supporting horizontal frequency in the range **30KHz – 95KHz.** The monitor shall be capable of supporting vertical frequency in the range **50Hz – 160Hz.**

7.2 General Format (Factory Aligned Mode)

The monitor's primary factory aligned preset shall be **VESA 1024×768 75Hz.**
(All factory alignments should be performed at **VESA 1024 × 768 @75Hz timing**).

7.3 Color Temperature

The monitor's preset color temperature shall be **9300K + 27 M.P.C.D, 6500K + 8 M.P.C.D, 5000K + 8 M.P.C.D.**

7.4 Preset Mode (Factory Mode)

The monitor's **factory preset** resolution and frequencies shall be as follow :

PRESET MODE (FACTORY MODE)		FREQUENCY HORIZONTAL	FREQUENCY VERTICAL	SYNC HORIZONTAL	POLARITY VERTICAL
VGA.	640×400	31.47 KHz	70 Hz	-	+
VGA.	640×480	37.5 KHz	75 Hz	-	-
VESA	800×600	46.875 KHz	75 Hz	+	+
MAC	932×624	49.714 KHz	74.534 Hz	-	-
VESA	1024×768	60.03 KHz	75 Hz	+	+
VESA	1024×768	68.68 KHz	85 Hz	+	+
MAC	1152×870	68.68 KHz	75 Hz	-	-
VESA	1280×1024	79.976 KHz	75 Hz	+	+
VESA	1280×1024	91.146 KHz	85 Hz	+	+
VESA	1600×1200	93.750 KHz	75 Hz	+	+

User Modes : User programmable modes within scanning frequencies

8.0 SIGNAL

8.1 Video Input

TYPE : ANALOG R.G.B.
INPUT IMPEDANCE : 75 OHM +/- 5%
INPUT LEVELS : RANGE FROM 0V (BLACK) TO 0.7V

8.2 Video Bandwidth

150 MHz pixel rate input signal

8.3 Scanning Frequencies

HORIZONTAL : 30 KHz – 95 KHz
VERTICAL : 50 Hz – 160 Hz

9.0 POWER SUPPLY

9.1 Power Cord
Us model will use UL/CSA approved 1.83 meters power cord (Wall type).
Europe model will use vde approved 1.83 meters power cord (PC type).

9.2 Power Source
90 ~ 264VAC, 50Hz / 60Hz

9.3 Maximum Power Consumption
The monitor's maximum power consumption shall be **130watts.**

10.0 POWER MANAGEMENT

MODE	H SYNC	V SYNC	POWER CONSUMPTION
STAND BY	NO	YES	15W
SUSPEND	YES	NO	15W
OFF	NO	NO	3 W (260VAC)

11.0 CRT (CATHOD RAYTUBD)

11.1 CRT Type
SAMSUNG [M46QCE261×112 (TCO)]

11.2 Size
The CRT screen shall be 19 inch. The viewable screen shall be 18.0 inch min.

11.3 Phosphor
The dot pitch shall be a nominal **0.26 mm.**

11.4 Mask
The mask shall be of the shadow mask type with a pitch sufficient to support the phosphor pitch.

12.0 FACEPLATE

12.1 Treatment
The faceplate Anti-Glare, Anti-Static treatment shall be Semi-tint.

12.2 Transmission
The faceplate light transmission percentage shall be 53.5%

12.3 Radius of Curvature
The CRT front panel radius of curvature shall be fst.

12.4 Deflection Angle
90 Degrees

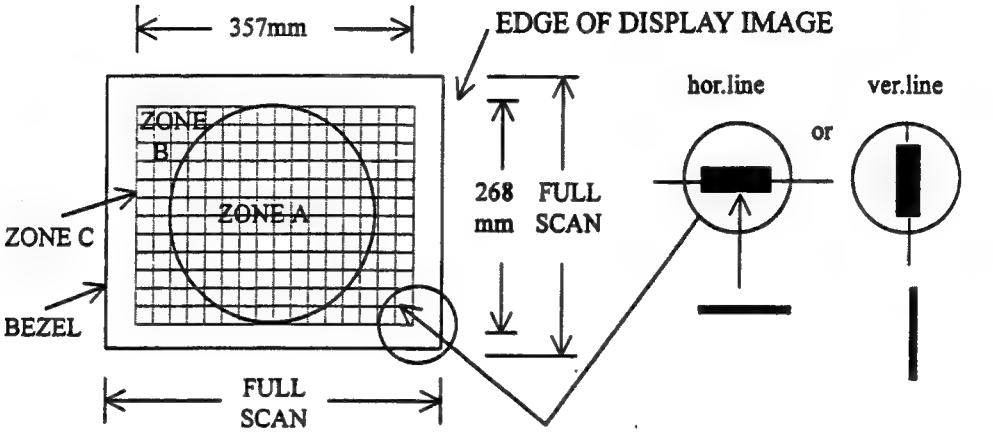
12.5 Array Type
DOT Trios

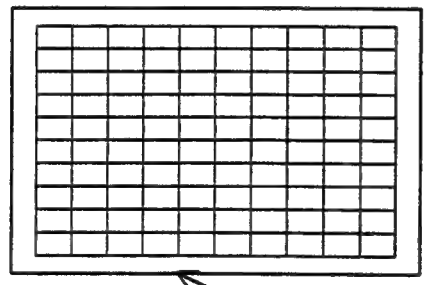
12.6 Implosion Protection

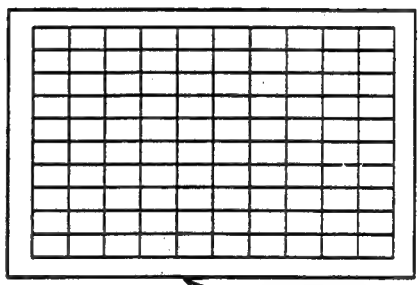
Integral

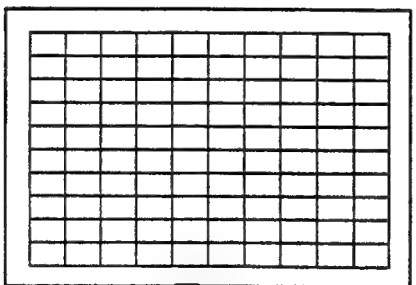
12.7 Convergence

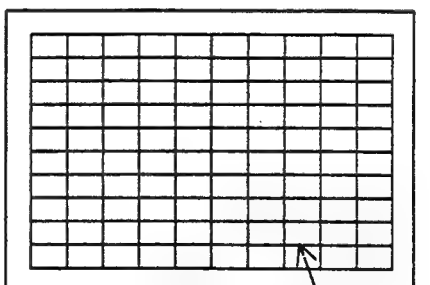
ZONE A (CENTER CIRCLE AREA OF 268 mm DIAMETER) : **0.3 mm MAX.**
ZONE B (SQUARE AREA of 357×268 mm² EXCEPT ZONE A) : **0.4 mm MAX.**
ZONE C (FULL SCAN AREA EXCEPT ZONE A AND ZONE B) : **0.45 mm MAX.**
USE CONVERG-RB, CONVERG-GB, CONVERG-RG AND CONVERG-W.











12.8 Light Output (Contrast Max. & Brightness Middle)

Average : **28 FLS** min with white flat field pattern.

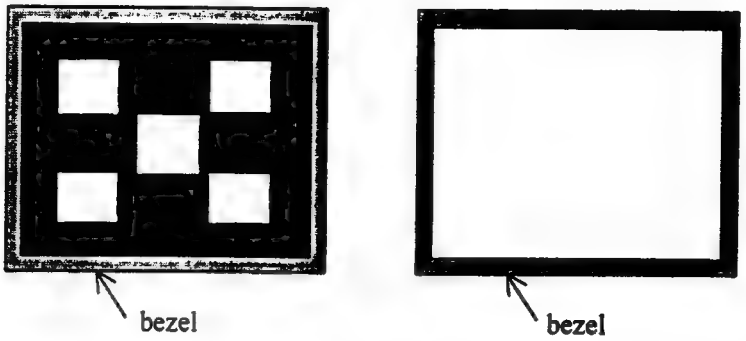
Peak : **38 FLS** min with 3"×3" block pattern.

12.9 Brightness Uniformity

The max. center to corner light fall off shall be no more than 30%.

Brightness uniformity is 75% (the minimum brightness area should be at least 75%) of maximum brightness area.

(Between picture center and other point)



12.10 White Unifoemity (CRT Color Uniformity) (9300K+27 M.P.C.D) (BH=0 mG)

The five area of image shall not exceed 0.02 variation at the x and y color coordinated. (**Total variation of 0.02**) **x max – x min < 0.010**

y max – y min < 0.012

12.11 Luminance Linearity

16 Stairsteps must be discernible

12.12 Temperature Stability

No more than 5FLS change at 30FLS between 10~40 DEG C.

12.13 Turn off Spot

At 30FLS, no persistent spot when turn off.

12.14 Retrace Line

No visible retrace line at normal operation.

13.0 IMAGE PERFORMANCE

13.1 Conditions

The monitor's brightness control set to 50%

The monitor's contrast control set to 100%

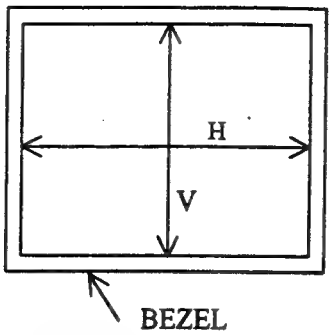
Primary video mode (1024×768 75Hz), unless otherwise specified.

13.2 Image Size

The active default display size shall be **Hor, 357+-4 mm, Ver. 268+-4 mm. For primary preset.**

The active default display size shall be **Hor. 357+-5 mm, Ver. 268+-5 mm. For other preset.**

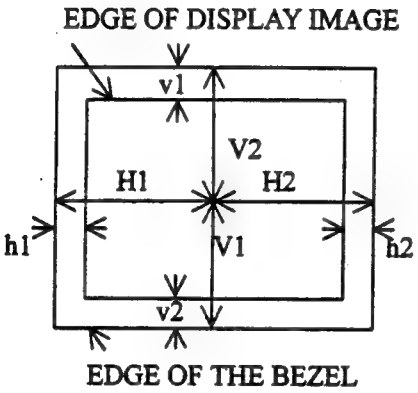
The displayed image shall be expandable to full screen in video mode.



H=357+-4mm
V=268+-4mm } For primary preset

H=357+-5mm
V=268+-5mm } For other preset

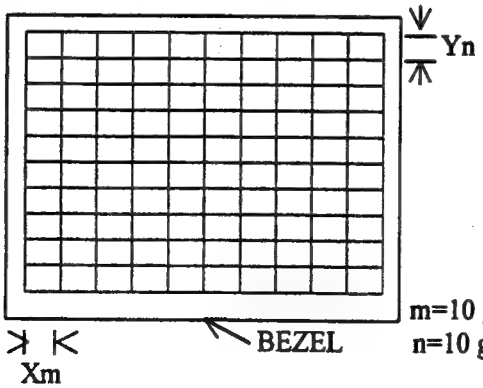
13.3 Image Centering



		Primary preset	Others preset
HOR.	$\left\lvert \frac{H1-H2}{h1-h2} \right\rvert$	≦4 mm	≦5 mm
VER.	$\left\lvert \frac{V1-V2}{v1-v2} \right\rvert$	≦4 mm	≦5 mm

13.4 Raster Linearity

	VESA 1024×768 75Hz	Others preset
HORIZONTAL LINEARITY	≦4%	≦5%
VERTICAL LINEARITY	≦4%	≦5%



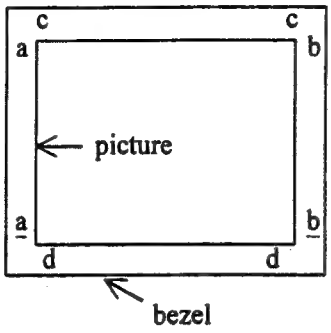
$$\text{HOR. LINEARITY} = \left\lvert \frac{Xmax-Xmin}{Xmax+Xmin} \right\rvert$$

$$\text{VER. LINEARITY} = \left\lvert \frac{Ymax-Ymin}{Ymax-Ymin} \right\rvert$$

m=10 grids
n=10 grids

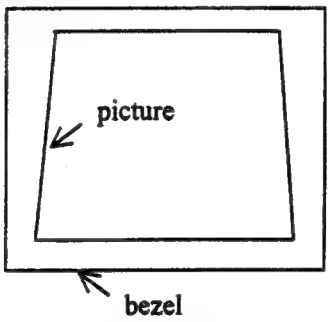
13.5 Geometry Distortion

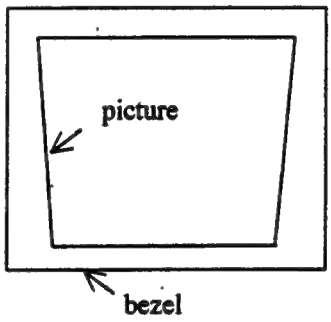
13.5a Trapezoid / Parallelogram Distortion
(UNDER TILT DISTORTION=ZERO)



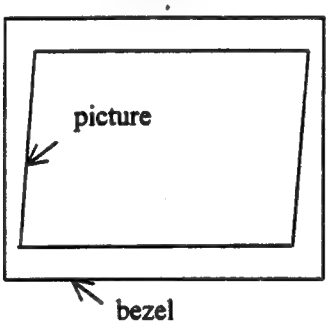
$|a - \underline{a}| \leqq 2\,mm$
$|b - \underline{b}| \leqq 2\,mm$
$|c - \underline{c}| \leqq 2\,mm$
$|d - \underline{d}| \leqq 2\,mm$

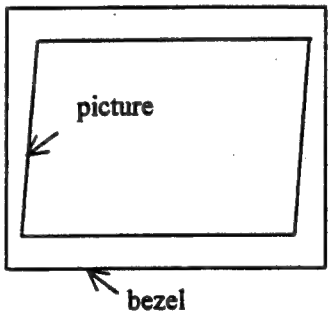
TRAPEZOID



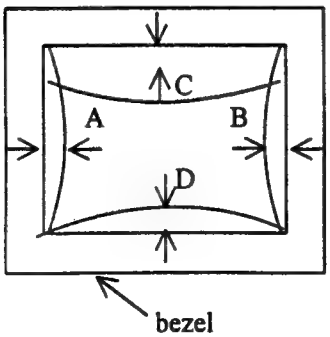


PARALLELOGRAM

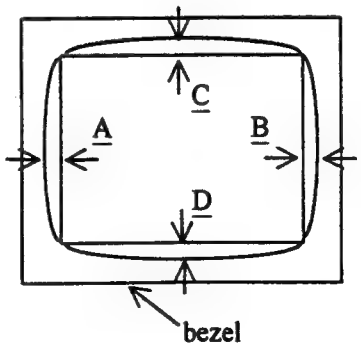




13.5b Pincushion / Barrel Distortion
(UNDER TILT DISTORTION=ZERO)

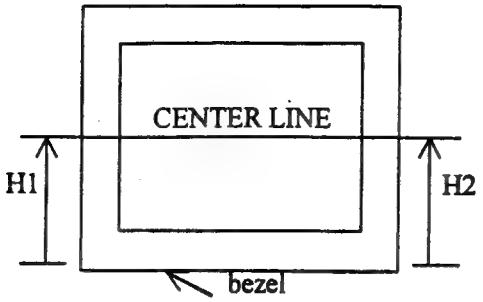


A, B≦2mm C, D≦2 mm



A, B≦2mm C, D≦2 mm

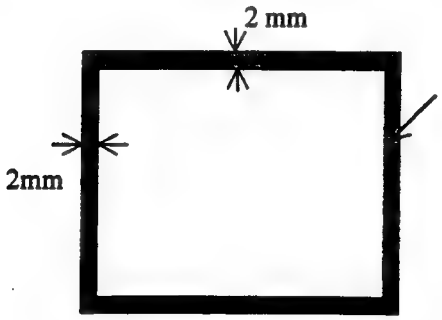
13.5c Tilt (Rotation)



| H1-H2 | ≦2 mm

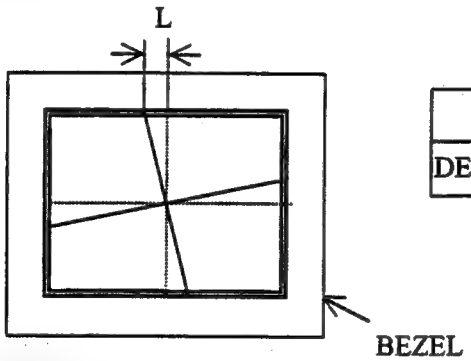
13.6 Image Quality

The sum of the geometry distortion is a **2mm box**, trapezoid, parallelogram, pincushion/barrel and tilt (ratation) are all considered as geometrical distortion.



2 mm DISTORTATION BOX

13.7 Orthogonality



ORTHOGONAL DISTORTION

	VESA 1024×768 75Hz
DEGREE	1.0

13.8 Line Straightness

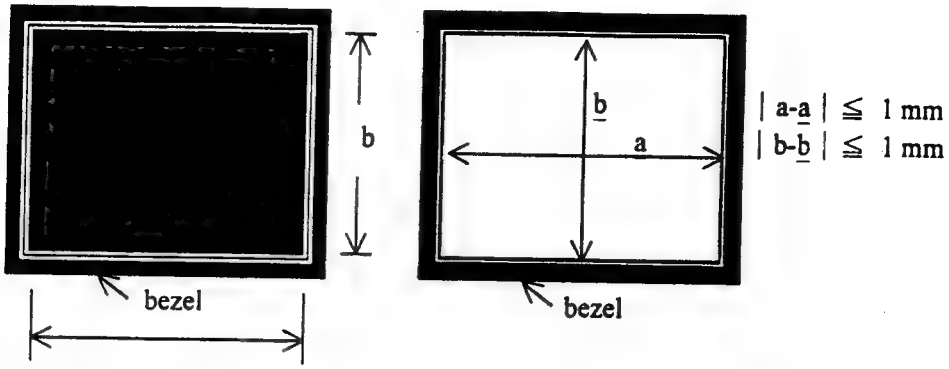
Line straightness distortion shall be less than **1.0 mm**, but as long as the overall geometry distortion is within 2.0 mm distortion box, this item is acceptable.

13.9 Jitter

Maximun jitter shall be **0.1 mm** when view from **45 cm.**

13.10 Static Regulation

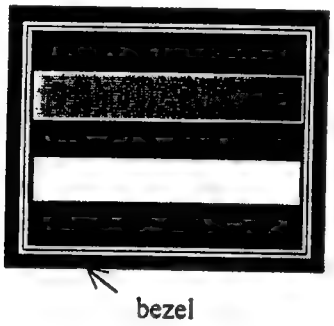
Worst case static regulation shall be less than ≦ 1.0 mm.



Measure the change in position between full load and no load display at the edge along the center point on the top, bottom, left and right edges.

13.11 Dynamic Regulation

Worst case dynamic regulation shall be **1 mm.**



The display of the edges of the active display in response to line intensity within a single video frame.

13.12 White Balance (Color Temperature)

X=0.281+/-0.015	X=0.281+/-0.02 at 9300K	X=0.313+/-0.02 at 6500K	X=0.346+/-0.02 at 5000K
Y=0.311+/-0.015	Y=0.311+/-0.02	Y=0.329+/-0.02	Y=0.359+/-0.02

VESA 1024×768 75Hz+/-0.015; OTHER PRESET +/-0.02 **AT 25 FLS**

Note : The minmum luminance shall be at 30FLS, Contrast=Max Brightness=Raster Cutoff.

13.13 Color Tracking

Between 10FLS to 30FLS, the x and y color coordinates shall be as follow :
In "3×3" block pattern.

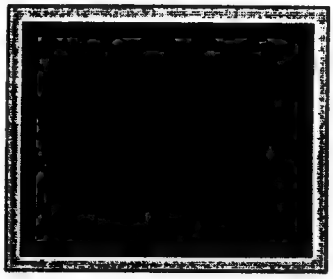
$|x(10FLS)-x(30FLS)| = \triangle x$ $|y(10FLS)-y(30FLS)| = \triangle y$

	VESA 1024×768 75Hz
△x	≦0.010
△y	≦0.012

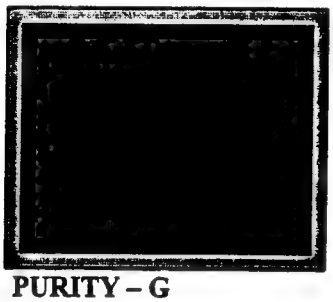
13.14 Purity

The screen shall appear uniform for the flat white field and for each of the primary color raster with no observed illuminate of any other color. There shall be no visible impingement in the white field or in the primary colors over the surface of the field. conditions : use purity-W, purity-R, purity-G and purity-B pattern.

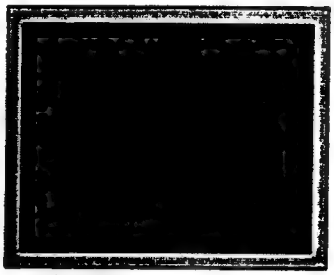
PURITY – W



PURITY – R



PURITY – G



PURITY – B

13.15 Focus

The external contrast control is adjusted for **25FL** light output with flat white field pattern, then switch to a character pattern filled with "**mE**" characters. The characters should be readable and distinguishable.

13.16 M.T.F. (Modulation Transfer Function)

$$\frac{\text{UPPER CURSOR INTENSITY - LOWER CURSOR INTENSITY}}{\text{UPPER CURSOR INTENSITY + LOWER CURSOR INTENSITY}} \times 100\%$$

Measure the M.T.F using a microvision superspot 200 display analysis system. M.T.F determines the focus performance. at M.T.F number of < 45 is poor

45 ~ 59 acceptable

60+ superior

13.17 Degaussing

Automatic degaussing when power-on at cold start.

Manual degaussing when push "DEGAUSS" in OSD. The picture is degaussing.

13.18 Image Size Variation

The image size shall remain within +/ - 0.5% for horizontal and vertical compared to initial size under the following variation respectively ac input voltage : 90V~264V ambient temperature varied from 25 to 40 degrees C.

14.0 ELECTROSTATIC DISCHARGE (ESD)

In accordance with the requirement of IEC801-2

15.0 ARCING PROTECTION

CRT arcing shall not cause damage to monitor circuit or CRT.

16.0 ACOUSTICAL NOISE

No objectionable noise.

17.0 ENVIRONMENT

17.1 Temperature

Operating Temperature : 0 TO 40 DEGREES C
Storage Temperature : -40 TO +60 DEGREES C

17.2 Relative Humidity

Operating relative humidity : 5% to 95% relative humidity
Storage relative humidity : 5% to 95%

17.3 Altitude

The monitors operating altitude from 0 meters to +3000 meters.
The monitors storage altitude from 0 meters to +12000 meters.

18.0 MAGNETIC TESTING ENVIRONMENT

The magnitude of the **horizontal magnetic field** component in any direction shall be **less than 10 milligauss** unless otherwise specified. The magnitude of the vertical magnetic field shall be as shown unless otherwise specified : **(Monitor Facing East)**

MODEL NUMBER	LOCATION	STRENGTH MILLIGAUSS
VCDTS21475-2M	**NORTH AMERICA**	**BV=+490+-10mG**

Note : Zero horizontal field apply for factory alignment.

The horizontal magnetic fields set to check performance, and crt face east, west, south and north.

MODEL NUMBER	LOCATION	STRENGTH MILLIGAUSS
VCDTS21475-2M	**NORTH AMERICA**	**Bh=250mG+-10 mG,BV=490+-10 mG**

19.0 REGULATORY ASFETY

19.1 North America Regulatories (US & CANADA)

UL, CSA, DOC-B, DHHS, NOM

19.2 International Regulatories (ERUOPE & ROW)

TUV-GS, TUV-MPRII, TUV-Ergo, CE, CB, TCO95, E2000, EPA

20.0 VIDEO COMMUNICATIONS

20.1 EDID Vendor Name and EDID Product ID EDID Coding (DD) :

Manufacture id code : **"OQI"** (byte 8=3EH, byte 9=29H)
Edid product id code : **"DJ"** (byte 10=36H, byte 11=4AH)

20.1 EDID Established

The EDID established timing fields shall match with the factory timing setting specified.

21.0 CODING ASSIGNMENT

21.1 Product Name and Modelname

PRODUCT NAME : Optiquest V95-2
MODEL NUMBER : NORTH AMERICA VCDTS21475-2M

21.2 Serial Number Format

FORMAT : PPYWWnnnnn where
PP =REGIONAL PRODUCT ID CODE
Y =LAST DIGITAL OF MANUFACTUREING YEAR
WW =MANUFACTUREING WEEK
nnnnn =PRODUCTION SEQUENCE NUMBER (ASSIGN BY FACTORY)

21.3 Regional Product ID Code :

NORTH AMERICA PRODUCT ID CODE (1M) = 6J

21.4 UPC Coding

NORTH AMERICA (1M) : 76690809602 5

21.5 FCC ID Code

SELF DECLARATION

22.0 SCREEN DEFECTS

22.1 General

There shall be no visible phosphor or mask defects greater than 0.3 mm.

23.0 MECHANICAL DIMENSIONS

23.1 Dimension

The monitor's dimensions shall be 466 mm W, 480 mm D, & 481 mm H.

23.2 Footprint

The monitor's footprint shall be 280 mm W by 303 mm D.

23.3 Weight

The net weight shall be 21.0 Kg. The gross weight shall be 25.0 Kg.

23.4 Cabinet Color

The cabinet color shall be matching with plastic chip vs provided.

23.5 Logo

The logo and its placement shall be in accordance with ViewSonic bezel graphics specification, VSCBGRSPEC001. Artwork shall be provided by ViewSonic new product development.

23.6 Inspection Criterion – Molded Plastic

Workmanship shall comply with ViewSonic corporation molded plastic parts specification, VSCMPPSPEC001. All exterior plastic cabinet parts shall be approved, prior to entering production, by ViewSonic corporation engineering.

23.7 Inspection Criterion – Screen Printed Parts

Workmanship shall comply with ViewSonic corporation molded plastic parts specification, VSCBGRSPEC001. All exterior plastic cabinet parts shall be approved, prior to entering production, by ViewSonic corporation engineering.

24.0 SHOCK AND VIBRATION

24.1 Vibration

The packaged unit, complete with user's guides, paper inserts, cables, and software, shall meet with the requirements (Refer to the ViewSonic corporation packaging specification VSCPACSPEC001 for reference.) :

TEST CONDITION	SPECIFICATION
TEST ORDER	Y, Z, X AXIS
VIBRATION FREQUENCY	5-250 HZ
ACCELERATION	1.0G RANDOM
SWEEP TIME	1OCT./ min
TEST TIME	60 min PER AXIS

This test shall, at ViewSonic request, be conducted with a ViewSonic corporation engineer observer present.

24.2 Shock

The packaged unit, complete with user's guides, paper inserts, cables, and software, shall meet the following requirements after successfully completion section 14.1 above (Refer to the ViewSonic corporation packaging specification VSCPACSPEC001 for reference.) :

TEST CONDITION	SPECIFICATION
ANY 1 CORNER	50.8 cm HEIGHT
6 FACES	50.8 cm HEIGHT
3 EDGES RADIATING FROM WEAK ORNER	50.8 cm HEIGHT

This test shall, at ViewSonic request, be conducted with a ViewSonic corporation engineer observer present.

25.0 PACKAGING

25.1 General Requirements

The packaged unit, complete with user's paper inserts, cables, and software, shall meet the requirements of the ViewSonic corporation packaging specification VSCPACSPEC001. The product box shall be of the one-piece type. There shall be no handholds on the shipping carton. The box/foam assembly shall comply with the requirements set forth in ViewSonic corporation packaging specification VSCPACSPEC001.

25.2 Packing Quality

Minimun container loading for a standard 40 feet shipping container shall be 240 units for a palletized load.

26.0 MANUALS AND DOCUMENTATION

26.1 Owners Manual

Shall be included within the monitor. Actual production samples of the manual will be provided to ViewSonic for approval prior to mass production.

26.2 Additional Customer Documentation

Samples of all inserted material will be provided to ViewSonic for approval prior to mass production.

26.3 Product Label

The product label shall comply with the requirements that are provided by ViewSonic corporation engineerion. Samples of the product label will be provided to ViewSonic engineering prior to mass production.

27.0 TILT / SWIVEL BASE (DETACHABLE)

TILT	: 5 Degrees forward and 15 degrees backward from vertical
SWIVEL RANGE	: 180 DEGREES
HEIGHT	: 53mm

28.0 TRADEMARKS

ViewSonic is a registered trademark of the **ViewSonic Corporation**

VESA is a registered trademark of the **video electronisc standards association. DPMS** and **DDC** are trademarks of VESA.

DPMS	**: Display Power Management System**
DDC	**: Display Data Channel.**

Energy star is a trademark of the U.S **environmental production agency (EPA).**

E2000 is a trademark of U.S in 2000.

29.0 APPENDIX DDC (DISPLAY DATA CHANNEL) DEFINED

DDCTest for OPTIQUEST V95-2

128 BYTES OF EDID CODE:

	0	1	2	3	4	5	6	7	8	9
0	00	FF	FF	FF	FF	FF	FF	00	3E	29
10	36	4A	01	00	00	00	02	09	01	02
20	0D	24	1B	BA	EB	5E	82	A3	53	46
30	98	24	11	48	4F	FF	FF	80	31	59
40	45	59	61	59	71	4F	81	40	81	59
50	A9	40	A9	4F	86	3D	00	C0	51	00
60	30	40	40	A0	13	00	65	0C	11	00
70	00	1E	00	00	00	FF	00	36	4A	39
80	30	32	30	30	30	30	31	0A	20	20
90	00	00	00	FD	00	32	A0	1E	5F	0F
100	00	0A	20	20	20	20	20	20	00	00
110	00	FC	00	56	39	35	2D	32	0A	20
120	20	20	20	20	20	20	00	A9		

(08-09) ID Manufacturer Name..... = OQI
(10-11) Product ID Code..... = 364A (6J)
(12-15) Last 5 Digits of Serial Number..... = 00001
(16) Week of Manufacture..... = 02
(17) Year of Manufacture..... = 1999
(10-17) Complete Serial Number..... = 6J90200001
(18) EDID Structure Version Number..... = 1
(19) EDID Structure Revision Number..... = 2
(20) VIDEO INPUT DEFINITION: =
Separate Sync, Composite Sync, Analog signal,
0.700V/0.300V (1.000 Vp-p)

(21) Maximum Horizontal Image Size..... = 360mm
(22) Maximum Vertical Image Size..... = 270mm
(23) Display Gamma..... = 2.86
(24) DPMS Supported Feature:= Stand-by, Suspend, Active Off.
Display type = RGB color display

(25-34) CHROMA INFO:
Red x = 0.638 Green x = 0.276 Blue x = 0.143 White x = 0.281
Red y = 0.325 Green y = 0.596 Blue y = 0.066 White y = 0.311

(35) ESTABLISHED TIMING I:
720 x 400 @ 70Hz (VGA, IBM)
720 x 400 @ 88Hz (XGA2, IBM)
640 x 480 @ 60Hz (VGA, IBM)
640 x 480 @ 67Hz (MAC II, Apple)
640 x 480 @ 72Hz (VESA)
640 x 480 @ 75Hz (VESA)
800 x 600 @ 56Hz (VESA)
800 x 600 @ 60Hz (VESA)

(36) ESTABLISHED TIMING II:
800 x 600 @ 72Hz (VESA)
800 x 600 @ 75Hz (VESA)
832 x 624 @ 75Hz (MAC II, Apple)
1024 x 768 @ 87Hz (interlaced) (8514A, IBM)

1024 x 768 @ 60Hz (VESA)
1024 x 768 @ 70Hz (VESA)
1024 x 768 @ 75Hz (VESA)
1280 x 1024 @ 75Hz (VESA)

(37) Manufacturer's Reserved Timing:
1152 x 870 @ 75Hz (MAC II, Apple)

(38-53) Standard Timing Identification:
#1: 640 x 480 @ 85Hz
#2: 800 x 600 @ 85Hz
#3: 1024 x 768 @ 85Hz
#4: 1152 x 864 @ 75Hz
#5: 1280 x 960 @ 60Hz
#6: 1280 x 960 @ 85Hz
#7: 1600 x 1200 @ 60Hz
#8: 1600 x 1200 @ 75Hz

(54-71) Detail Timing Description #1: 1280x1024 Pixel Clock=157.5MHz

---

Horizontal Image Size=357mm Vertical Image Size=268mm
Refresh Mode: Non-Interlaced Normal display, no stereo

HORIZONTAL:

Active Time=1280 pixels Blanking Time=448 pixels
Sync Offset=64 pixels Sync Pulse Width=160 pixels
Border=0 pixels Frequency=91.1 kHz

VERTICAL:

Active Time=1024 lines Blanking Time=48 lines
Sync Offset=1 lines Sync Pulse Width=3 lines
Border=0 lines Frequency=85.0 Hz

Sync configuration: Digital Separate, V(+), H(+)

(72-89) Monitor Description:

Monitor Serial Number: 6J90200001

(90-107) Monitor Description:

Monitor Range Limits:
Vertical Frequency (min) = 50Hz
Vertical Frequency (max) = 160Hz
Horizontal Frequency (min) = 30kHz
Horizontal Frequency (max) = 95kHz
Maximum Supported Pixel Clock = 150MHz

(108-125) Monitor Description:

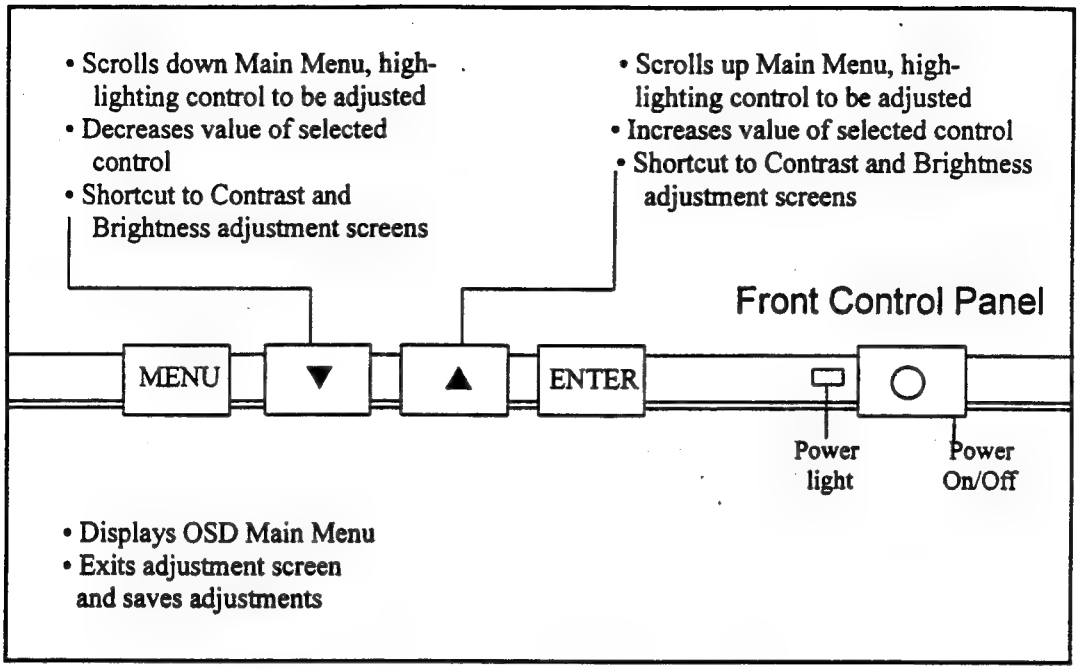
Monitor Name: V95-2

(127) Checksum OK.

2. OSD (on screen display) Function Control Method

- BASIC
  - Contrast / Brightness
  - H-size / Position
  - V-size / Position
  - Recall
  - Degauss
- GEOMETRY
  - Pincushion / Trapezoid
  - Pin Balance / Parallel
  - Rotation
  - Moire
  - Recall
- VIEW MATCH
  - 9300
  - 6500
  - 5000
  - USER
- VIEW METER
- OSD FUNCTION
- LANGUAGE

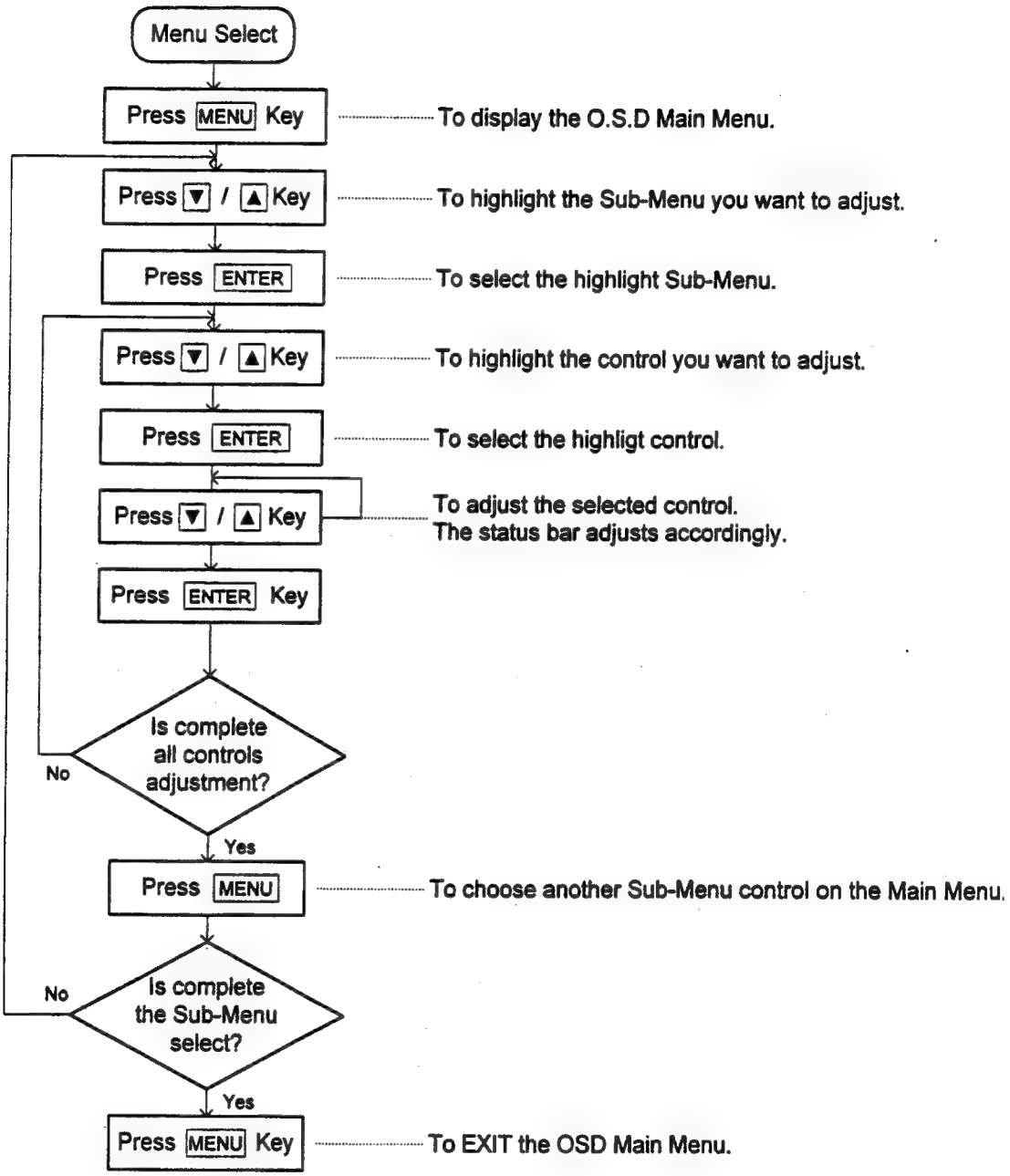
User Controls



Using the Front Control Panel to access OSD screens

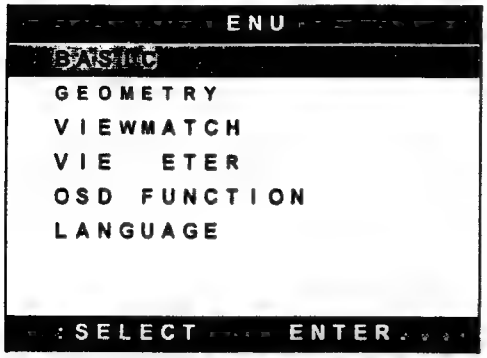
1. To turn the monitor on, press the Power button (shown above).
2. To display the OSD Main Menu, press button [MENU] .
3. To select a user control, press the ▼ or ▲ button repeatedly until the control is **highlighted.**
4. To select the highlight Sub-Menu, press [ENTER] .
5. To highlight the control you want to adjust, press ▼ or ▲ key.
   Exception : For user controls that do not require adjustments, press button [ENTER] again to activate, (examples : Degauss, Memory Recall).
6. To select the highlight control, press [ENTER] .
7. To adjust the selected control, press ▼ or ▲ key.
8. Press [ENTER] .
9. To choose another Sub-Menu control on the Main Menu, press [MENU] .
10. To save your adjustments and exit all screens, press button [ENTER] twice.
    The screen will clear automatically about 30 seconds after the last control button you press. To return to the Main Menu, repeat step 2.

Selection and adjustment flow chart

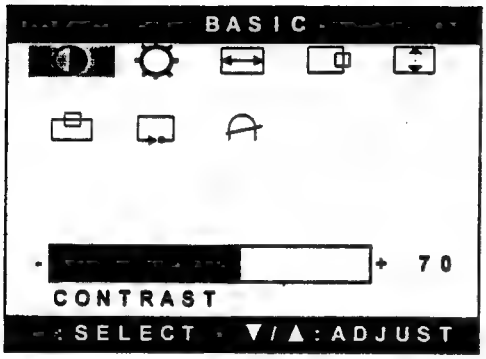


OnView® Main Menu

The OnView main menu from Optiquest® shows the various controls for adjusting the monitor. See the next few pages for more datails about each controls.



Menus disappear automatlecally about 25 seconds after pressing any button.



H-SIZE adjusts the width of the screen image
[▼] Decreases the width
[▲] Increases the width

H-POSITION moves the screen image left or right
[▼] Moves the screen left
[▲] Moves the screen right

CONTRAST adjusts the contrast between the image background (black level) and the foreground (white level)
[▼] Decreases contrast
[▲] Increases contrast

V-SIZE adjusts the height of the screen image.
[▼] Decreases the screen height
[▲] Increases the screen height

BRIGHTNESS adjusts the background black level
[▼] Decreases brightness
[▲] Increases brightness

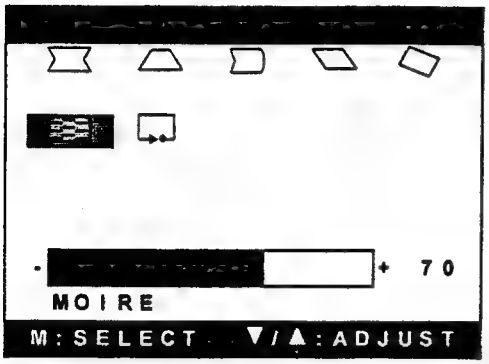
V-POSITION moves the screen image Up and down.
[▼] Moves the screen down
[▲] Moves the screen Up

Shortcut : press [▼] or [▲] for the CONTRAST/BRIGHTNESS control screen shown below

RECALL returns adjustments back to factory settings only if the monitor is operating in a factory preset mode. See the specifications section for factory presets.

Exception : This control does not affect changes made with the User color control.

DEGAUSS removes the build-up of magnetic fields that can affect color purity and convergence.
Note : The monitor automatically degausses when you turn it on. Wait at least 20 minutes before degaussing again.



PINCUSHION straightens the vertical sides of the screen image.
[▼] Curves the screen's vertical edges inward
[▲] Curves the screen's vertical edges outward

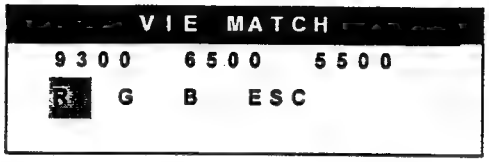
TRAPEZOID makes the vertical edges of the screen image paralled
[▼] Narrows the screen at the top and widens it at the bottom
[▲] Widens the screen at the top and narrows it at the bottom

PINBALANCE curves the vertical sides of the screen image.
[▼] curves vertical sides to the left
[▲] curves the vertical sides to the right

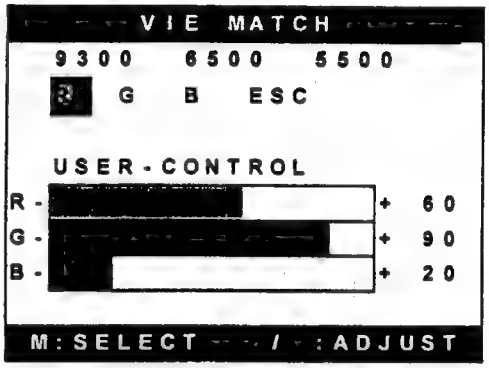
PARALLELOGRAM slants vertical sides of the screen image to the left or right.
[▼] slants vertical sides to the left
[▲] slants vertical sides to the right

TILT rotates the entire screen image.
[▼] Rotates the screen counter-clockwise
[▲] Rotates the screen clockwise

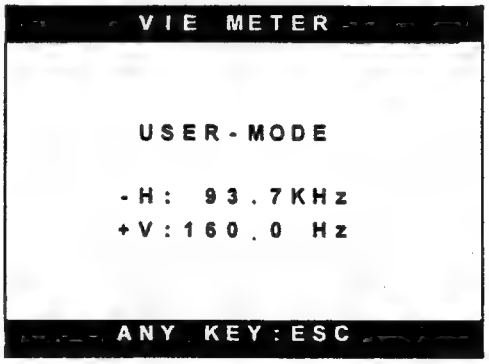
VIEWMATCH® color control from Optiquest® provides three preset color temperatures : 9300K, 6500K, and 5000K. The factory setting for this monitor is 9300 ° K, the color temperature most frequently used in offices with fluorescent lights.



RGB (red, green, blue) allows you to adjust the intensity of red, green, and blue.



VIEWMETER® from OptiQuest® displays the resolution and the frequency signal input coming from the video (graphics) card in your computer.

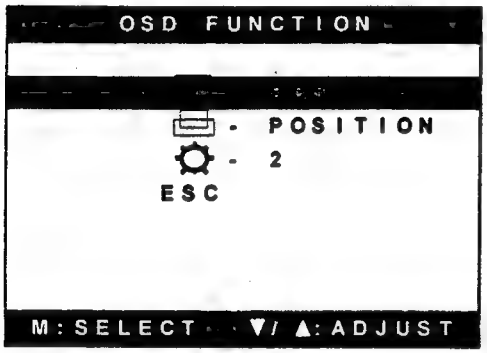


OSD (On Screen Display)
FUNCTION allows you to move the menu and control screens.

POSITION
[▼] moves the OSD menu to the left
[▲] moves the OSD menu to the right

POSITION
[▼] moves the OSD menu down
[▲] moves the OSD menu up

BRIGHTNESS
[▼] Dacreases brightness of the OSD
[▲] Increases brightness of the OSD



LANGUAGE allows you to choose from among five languages for the menu and control screens : English, German, French, Spanish, and Italian.

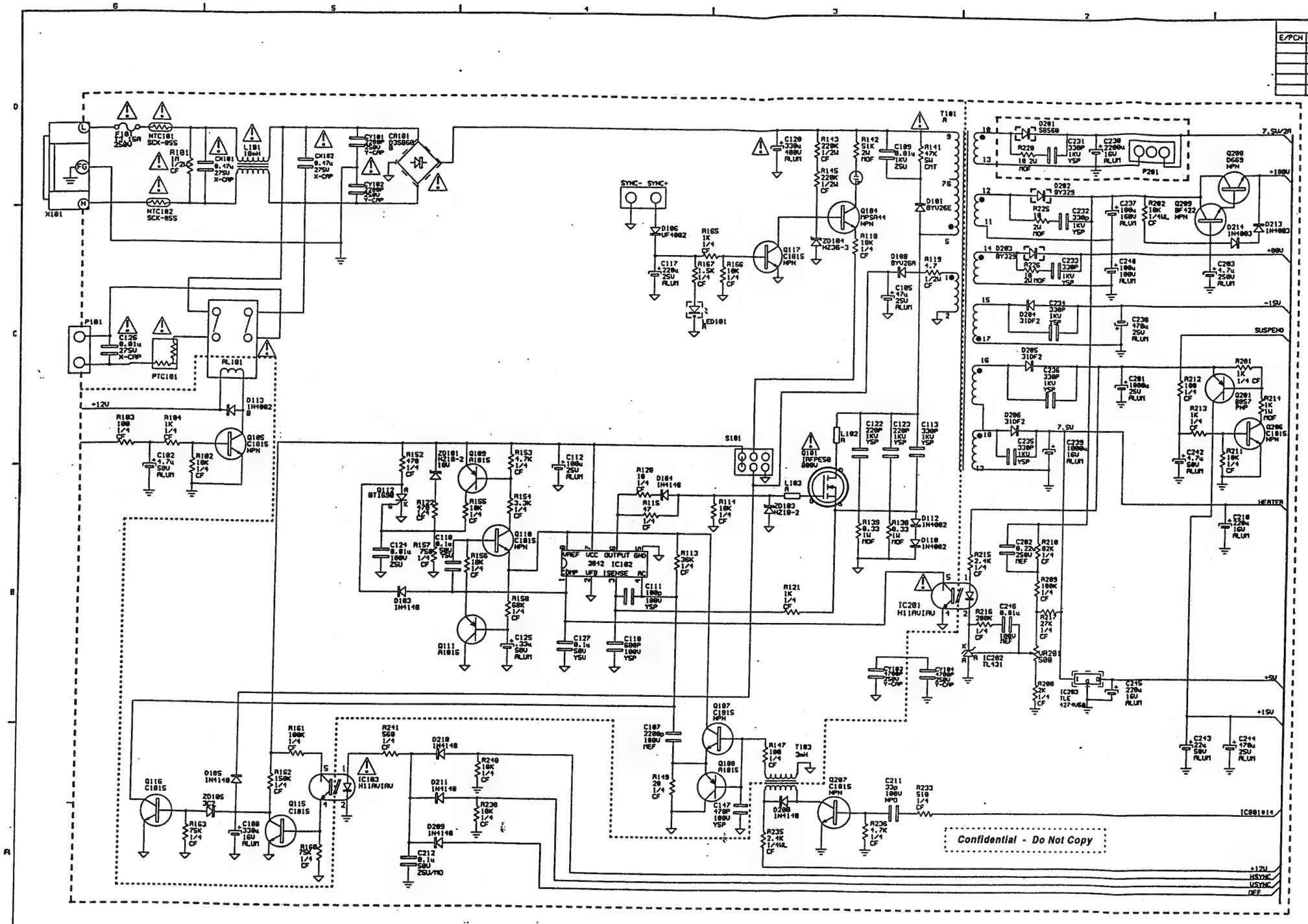
REVISIONS				
E/PCN	REV.	DESCRIPTION	DATE	APPROVED

Confidential - Do Not Copy

Optiquest Inc.	FN/DCN: START_NO: END_NO:	DRAWER LOTUS CHEN	CHECK Jackson Jao	APPROVER Roger	P.C.B.NAME C995M-11.PCB	MODEL NAME V95-2	DATE: 02-12-99 REV: 1 CODE: 1	SHEET 1/3

2970011401

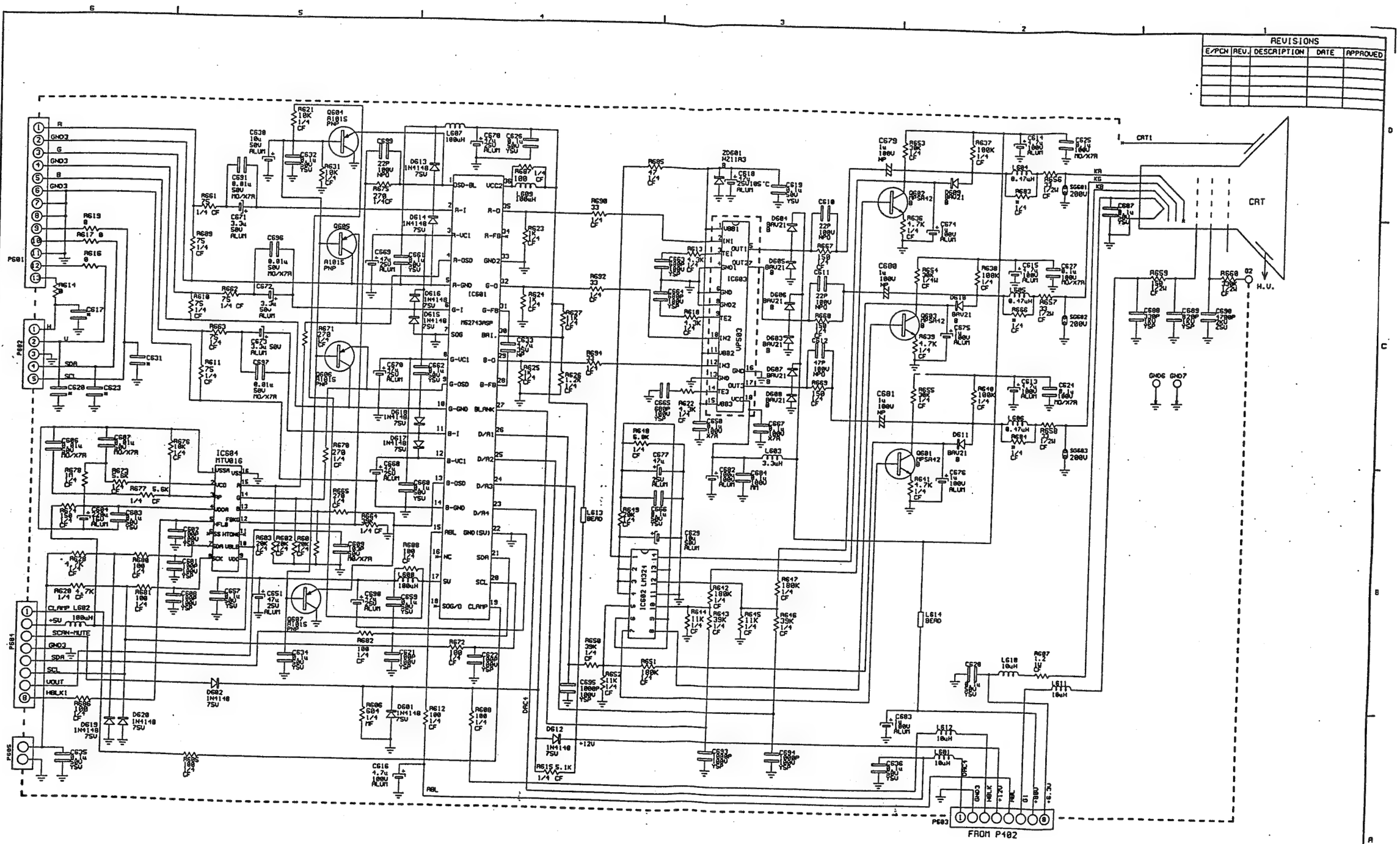
REVISIONS				
E/PCN	REV.	DESCRIPTION	DATE	APPROVED



2970011401

Optiquest Inc.	FN/DCN: START_NO.: END_NO.:	DRAWER	CHECK	APPROVER	P.C.B.NAME	MODEL NAME	DATE: 02-12-99"	SHEET
		JOAN LIN	Bill	Roy	C995M-11.PCB	V95-2	REV: 1 CODE: 1	2 / 3

REVISIONS				
E/PCN	REV.	DESCRIPTION	DATE	APPROVED



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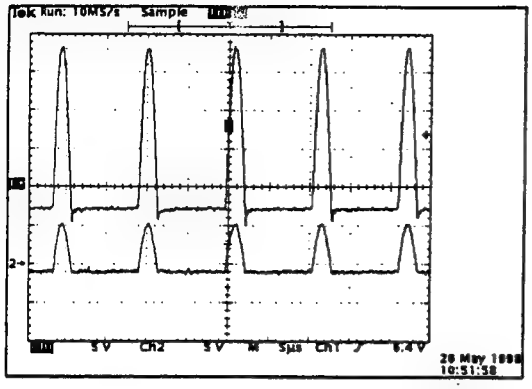
Optiquest Inc.	FN/DCN: START_NO.: END_NO.:	DRAWER: LOTUS CHEN	CHECK	APPROVER	P.C.B.NAME: 795VH-14.PCB	MODEL NAME: V95-2	DATE: 02-12-99" REV: 1 CODE: 4

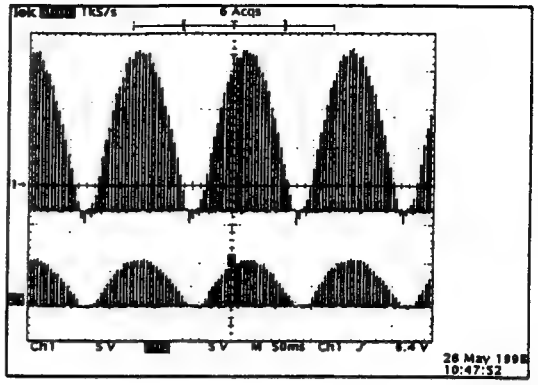
2970008401

SHEET 3 / 3

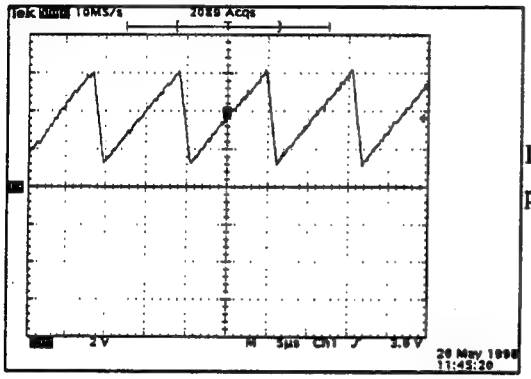
CIRCUIT DIAGRAM



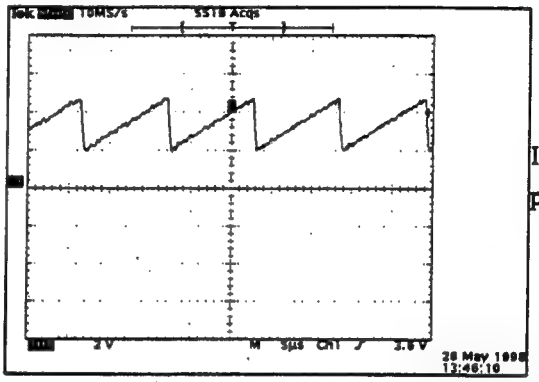
HFLY
(R403)



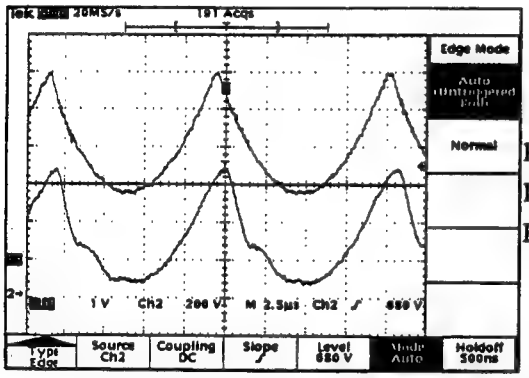
IC401
pin6



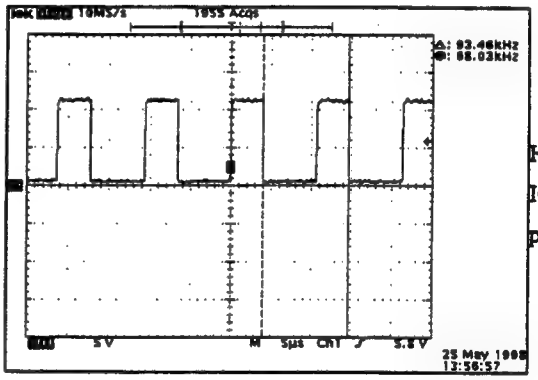
IC401
pin10



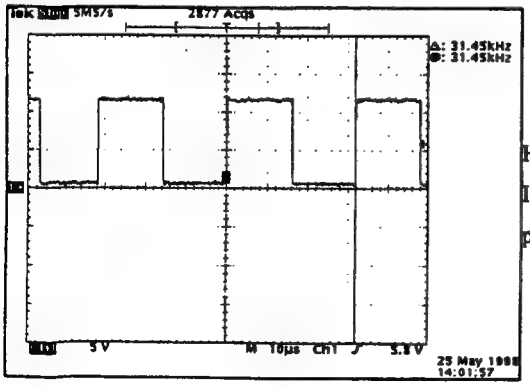
IC401
pin16



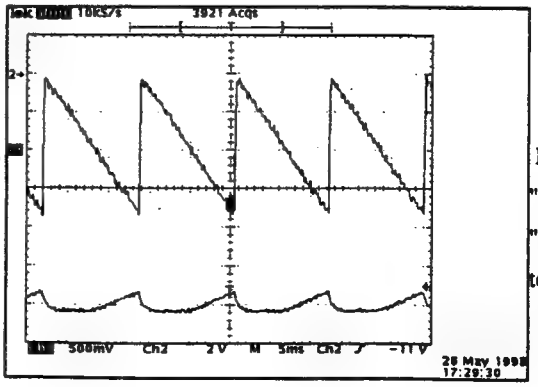
HFOCUS
IC401
PIN17



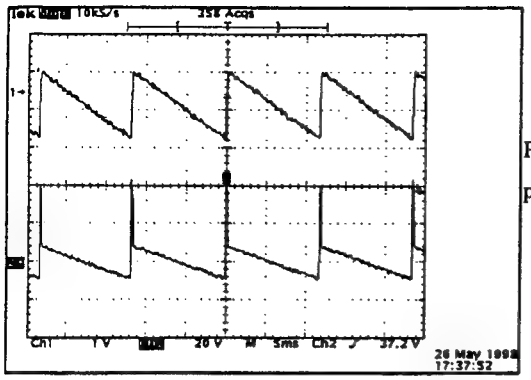
HOUTCOL
IC401
pin21



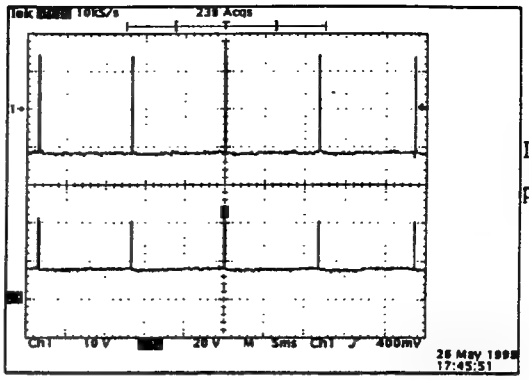
HOUTCOL
IC401
pin21



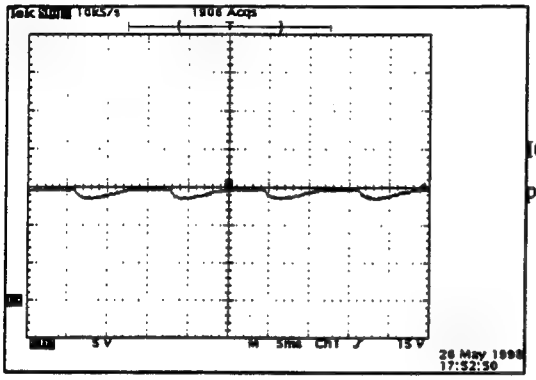
P401
"pin4"
"R508"
to Gnd



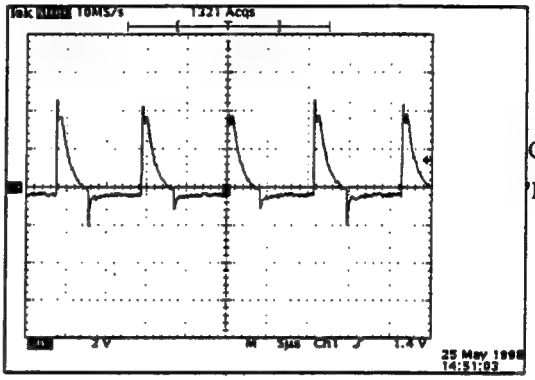
P401
pin3



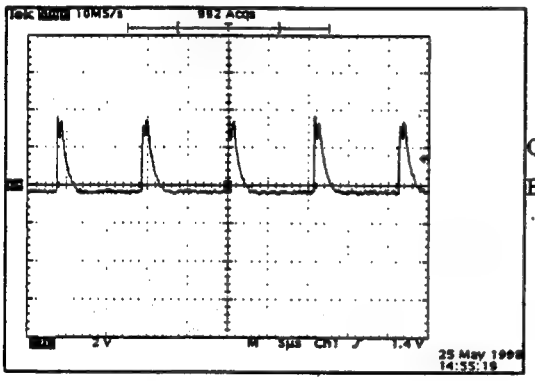
IC501
pin6



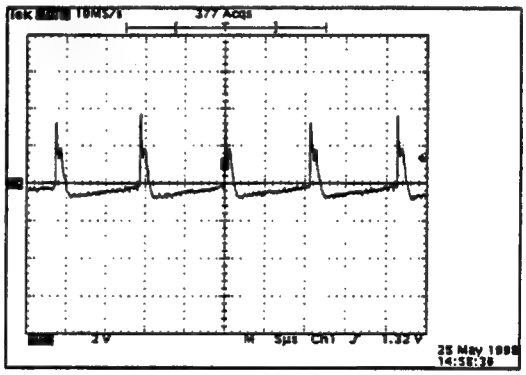
IC501
pin2



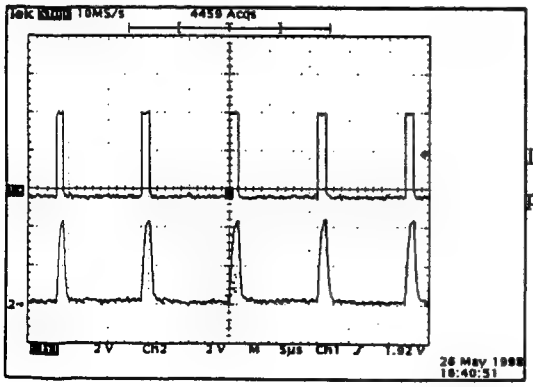
Q0401
"BASE"



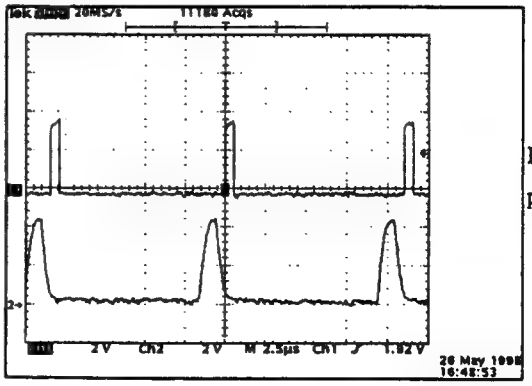
Q0401
Emitter



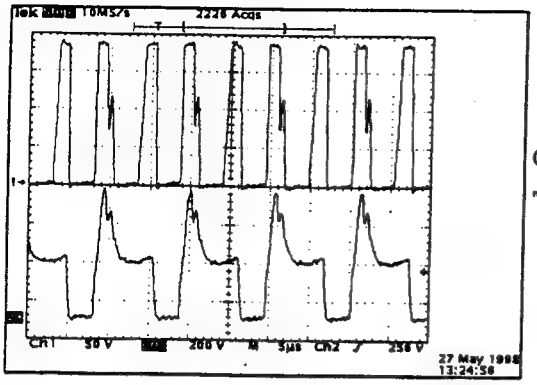
IC402
pin4



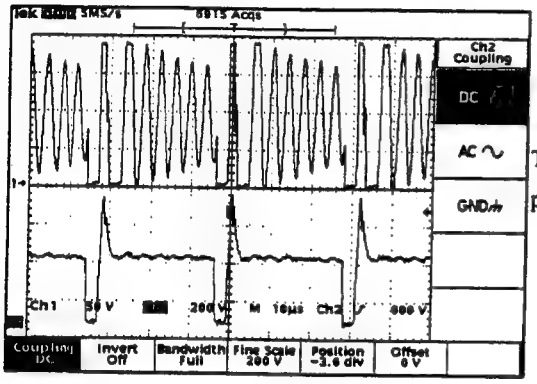
IC401
pin38



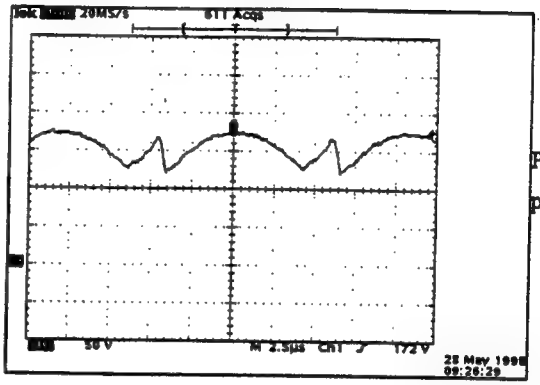
IC401
pin36



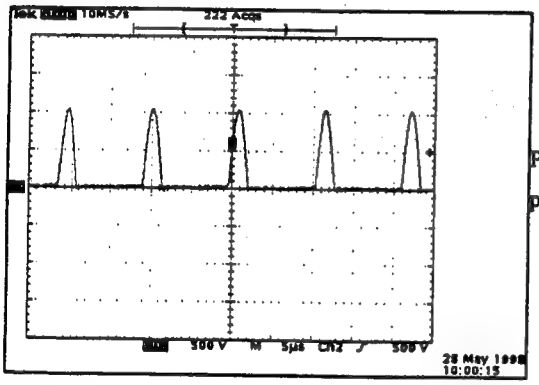
Q0404
"DRAIN"



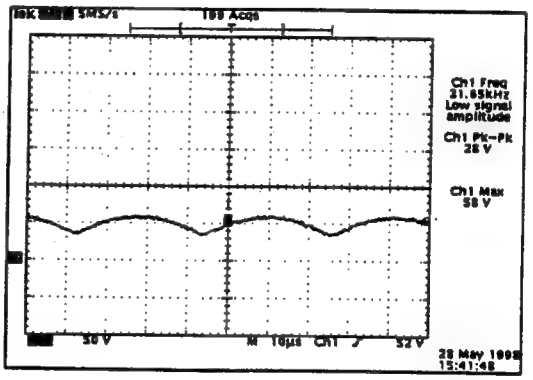
T402
pin ①



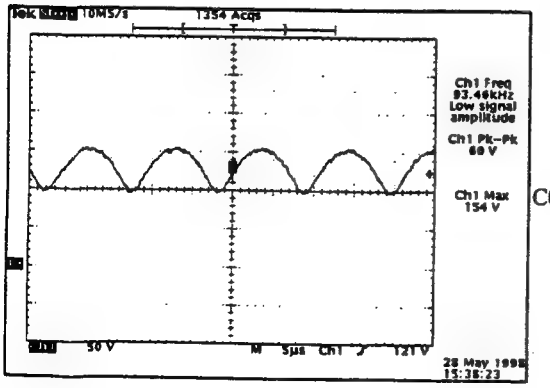
P401
pin ②



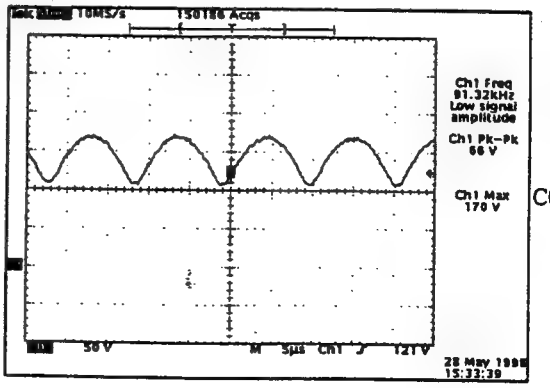
P401
pin ①



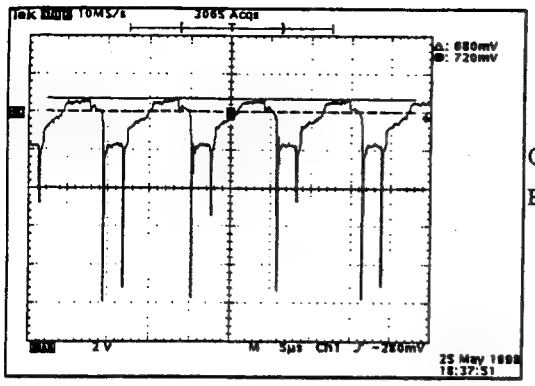
C0473



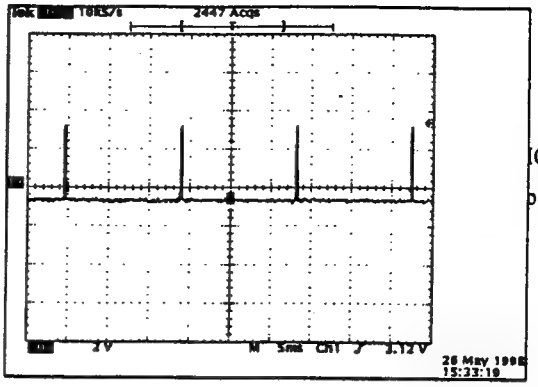
C0473



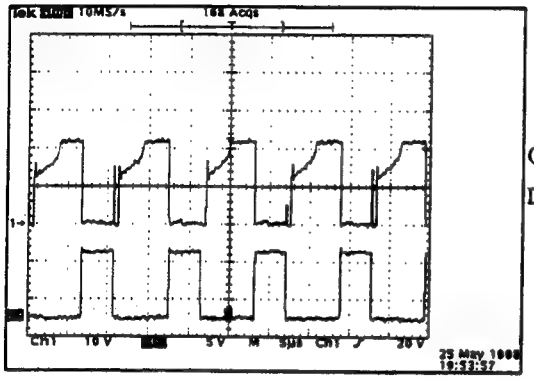
C0473



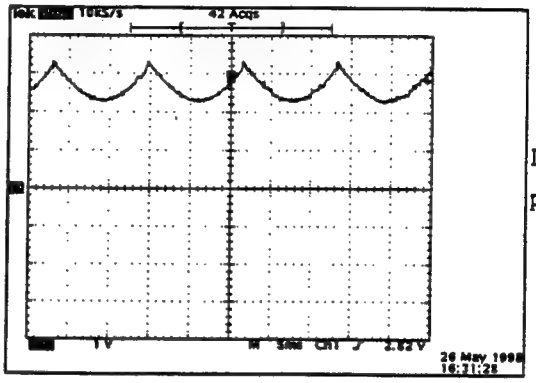
Q448
Base



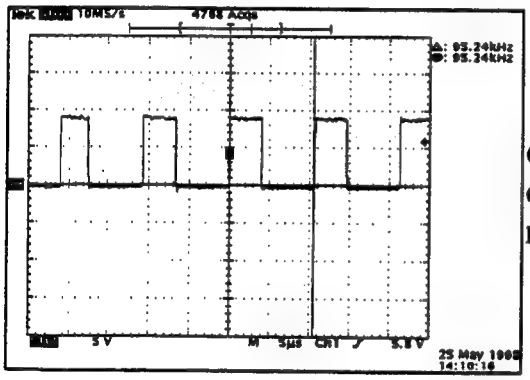
IC401
pin30



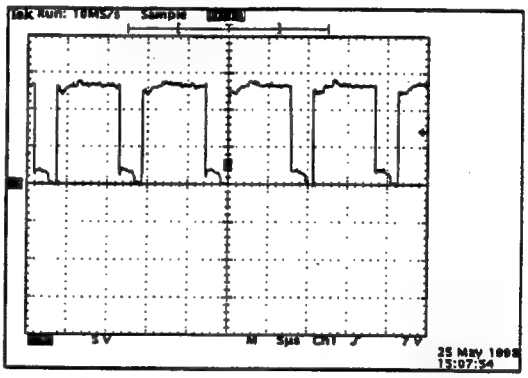
Q445
Drain



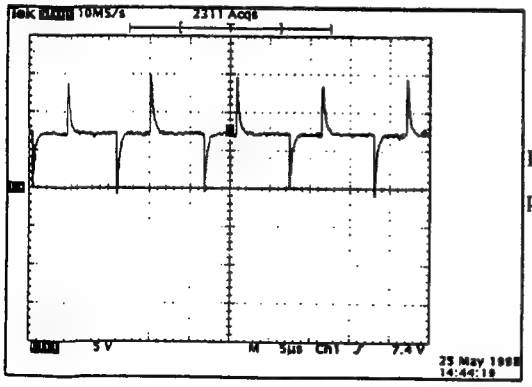
IC401
pin31



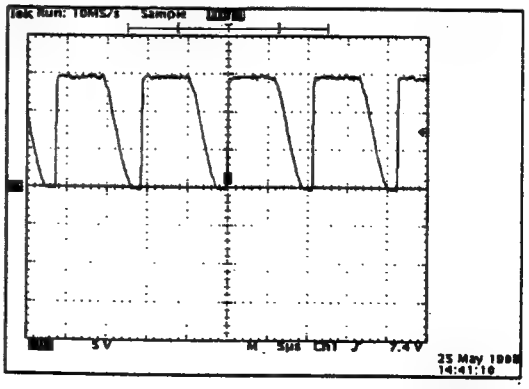
Q443/
Q444
Emitter



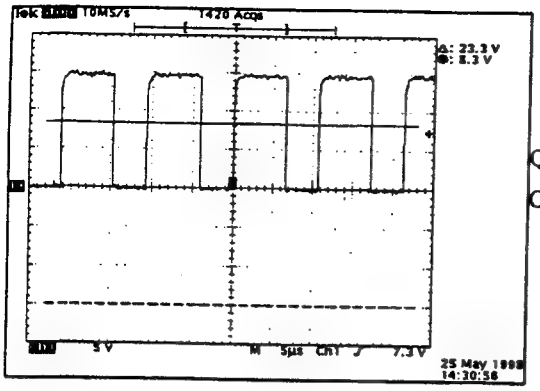
IC404
pin3



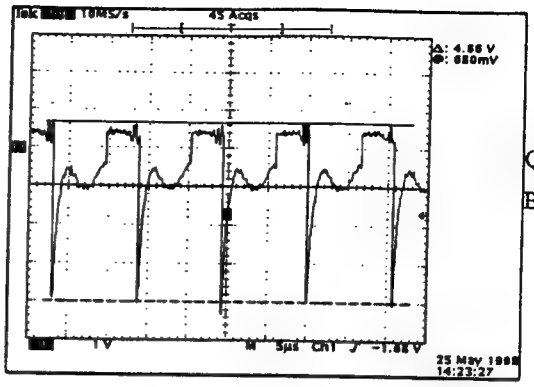
IC404
pin2



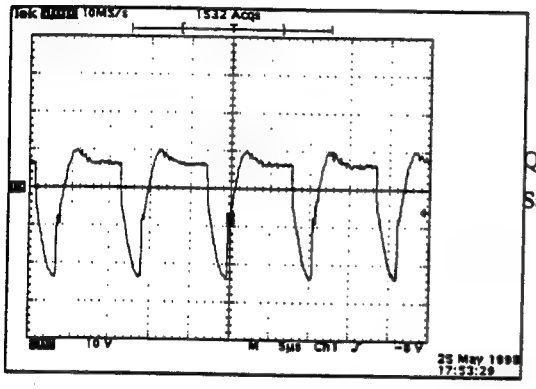
Q431
Collector



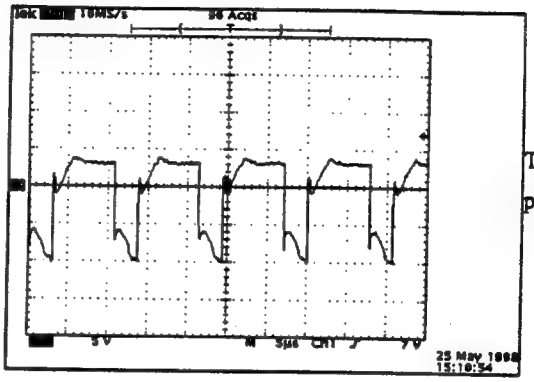
Q430
Collector



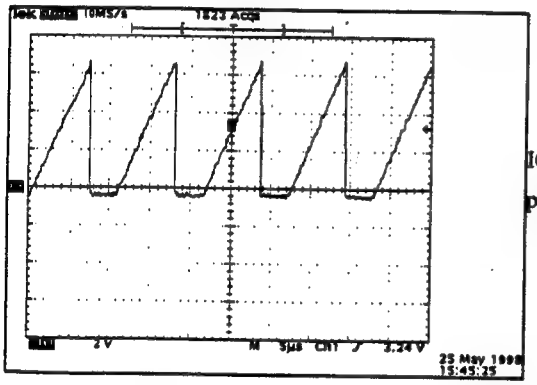
Q430
Base



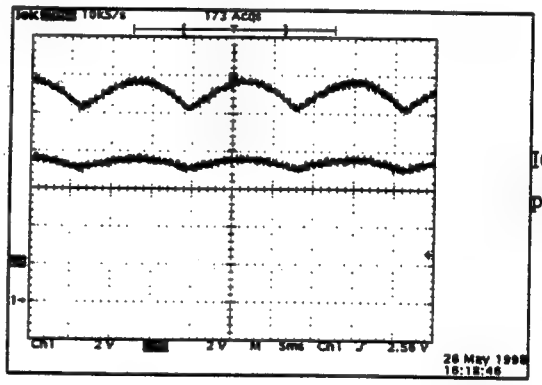
Q441
Saurce



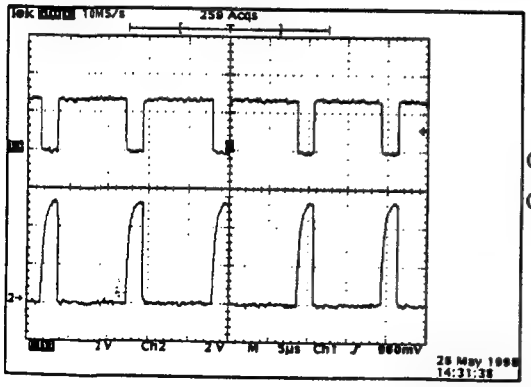
T401
pin ④



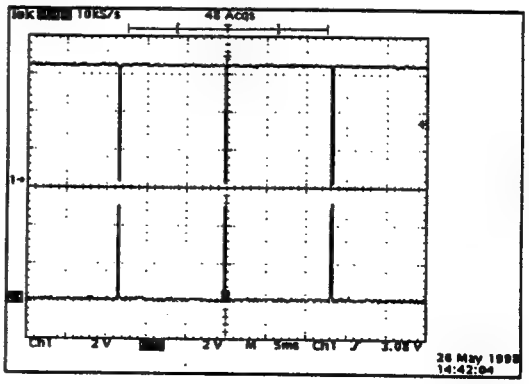
IC404
pin6/7



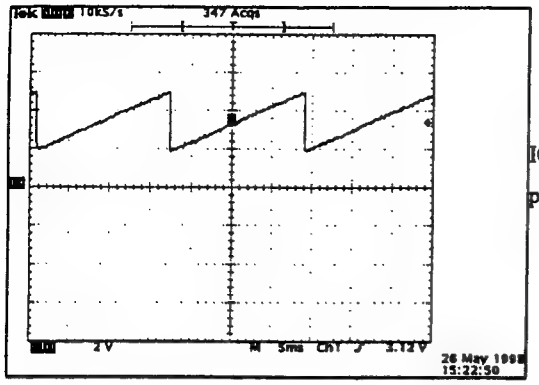
IC403
pin7



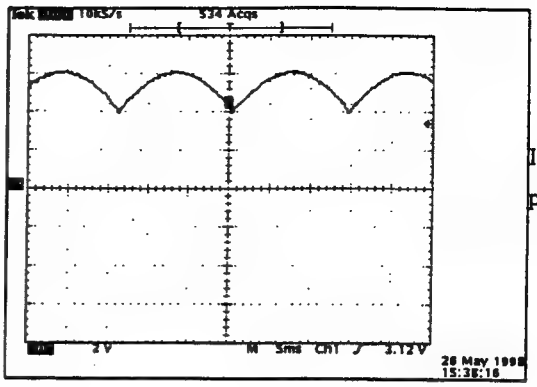
Q861
Collector



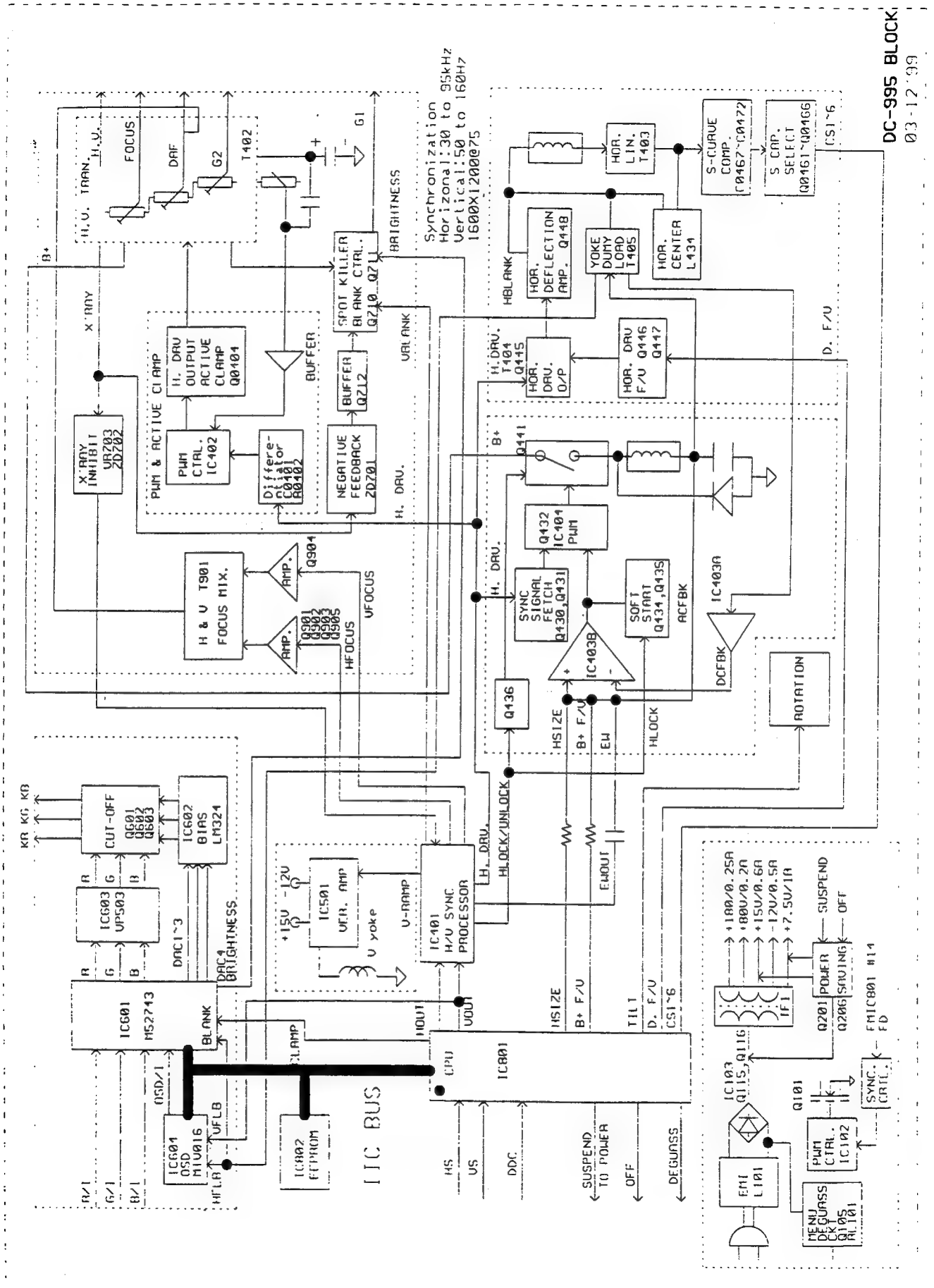
IC401
pin23



IC401
pin27



IC401
pin32


DC-995 SAT(V95) BLOCK
DC-995 BLOCK
03-12-99
Synchronization
Horizonal:30 to 95kHz
Vertical:50 to 160Hz
1600X1200@75
H.V. TRAN.
FOCUS
DAF
G2
T402
G1
BRIGHTNESS
SPOT KILLER
BLANK CTRL.
Q710,Q711
X-RAY
X-RAY INHIBIT
VR703
ZD702
PWM & ACTIVE CLAMP
H. DRV. OUTPUT ACTIVE CLAMP Q0404
PWM CTRL. IC402
Differe-ntiator C0401 R0402
BUFFER
BUFFER Q712
NEGATIVE FEEDBACK ZD701
H. DRV.
V.BLANK
H & V T901 FOCUS MIX.
AMP.
Q904
Q901 Q902 Q903 Q905
HFOCUS
VFOCUS
HBLANK
HOR. DEFLECTION AMP. Q448
HOR. LIN. T403
YOKE DUNY LOAD T405
HOR. CENTER L434
S-CURVE COMP. C0467~C0472
S CAP. SELECT Q0461~Q0466
CS1~6
H.DRV. T404 Q445
HOR. DRV. O/P
HOR. DRV F/V Q446 Q447
D. F/V
Q441
Q432 IC404 PWM
SYNC SIGNAL FETCH Q430,Q431
SOFT START Q434,Q435
ACFBK
IC403A
IC403B
DCFBK
Q436
HSIZE
B+ F/V
EW
HLOCK
ROTATION
KR KG KB
CUT-OFF Q601 Q602 Q603
IC602 BIAS LM324
IC603 VP503
IC601 M52743
DAC1~3
DAC4 BRIGHTNESS
IC501 VER. AMP
+15V -12V
V yoke
V-RAMP
IC401 H/V SYNC PROCESSOR
H. DRV.
HLOCK/UNLOCK
EWOUT
HOUT
VOUT
CLAMP
BLANK
OSD/I
IC604 OSD M1V016
VFLB
HFLB
IC802 EEPROM
IIC BUS
IC801 CPU
HS
VS
DDC
SUSPEND TO POWER
OFF
DEGUASS
TILT
+180/0.25A
+80V/0.2A
+15V/0.6A
-12V/0.5A
+7.5V/1A
IFI
Q201 POWER
SUSPEND
Q206 SAVING
OFF
FMIC801 #14
FD
IC103 Q115,Q116
Q101
EMI L101
PWM CTRL. IC102
SYNC. CRTL.
MENU DEGUASS CKT Q105 RL101

6. Circuit description

6.1 Power supply (switching power supply)
6.2 Power saving
6.3 Micro-controller unit
6.4 Sync processor

6.5 Deflection
6.5.1 Horizontal phase Shifter
6.5.2 Horizontal synchronization processing
6.5.3 Horizontal driver stage
6.5.4 Horizontal scanning
6.5.5 Buck converter and E-W pin cushion correction and width control PWM circuit
6.5.6 Trapezoid control / Parallel control / Pin balance control
6.5.7 High voltage power supply circuit
6.5.8 X-Ray-radiation protection
6.5.9 Vertical deflection
6.5.10 Focus
6.5.11 Blanking CKT
6.5.12 Rotation

6.6 Video
6.6.1 Video amplifier
6.6.2 On Screen Display (OSD)
6.6.3 Auto Beam Limit CKT (A B L CKT)
6.6.4 Brightness control
6.6.5 Contrast, gain & Bias control
6.6.6 DDC 1/2B

6. CIRCUIT DESCRIPTION

6.1 POWER SUPPLY(switching mode power supply fly-back type)(IC102)

The raw DC B+ voltage is got from AC input voltage after EMI filter rectifier. It supplies lower voltage VCC to PWM controller, IC102 (UC3842), through start-up circuit (Q104, R142, R143, R145, ZD104, NE101)to IC102 pin7. R113 & C111 generate triangle wave-form to decide switching frequency. In order to power supply synchronism, it must feedback Horizontal-Synch to "TRIGGLE" from T103, Q107, Q108 and forced power supply synchronization with Horizontal deflection circuit. The pin6 of IC103 is output to drive power MOSFET Q101. A High-frequency & High-Voltage square wave-form is across the primary winding and transfers energy to the secondary. The output DC voltage gets after rectifying and filtering.

In order to make a stable and regulated output voltage while AC input voltage and output load change. IC202 will produce a current change through IC201 couple a volt change on C127 feed to IC202 pin1. PWM controller circuit will adjust duty cycle and maintain stable voltage.

The PWM controller IC102 is started up from the raw B^+. The lower voltage VCC is provided by T101's AUX-Winding(pin1) through D108 , C105 to IC102 pin7.

At power saving mode, IC103 will be OFF. Q115 is turn off, too. Q116 will be on through ZD105 and R163. Thus, the Horizontal-Sync. will be pass to ground through Q116. The switching frequency determined factor of R113 and C111 will be short to ground to cease system operation.

Degauss CKT : When the power is on and press manual degauss, the IC801 pin1 will be high level to turn on Q105 and RL101, degauss will be active about 5 seconds.

Protection part:

The main power circuit OCP parts are R153, R154, R155, R156, R157, R158, Q109, Q110, Q111, R152, D103, Q112.

6.2 POWER SAVING

According to TCO agreement with monitor manufacturers is as the following table:

SYNC. INPUT	H. & V. PRESENTED	NO H. OR V.	NO H. AND V.
MODE TTL SIGNAL	NORMAL ON	SUSPEND	POWER OFF
SW1	Hi	Lo	Lo
SW2	Hi	Hi	Lo
LED	Green	Amber	Amber
Power (Watt)	Normal	< 15W	< 3W

SW1 : IC801 pin3, suspend (SUS)
SW2 : IC801 pin2, power down (OFF)

- SW1 and SW2 are Hi level at normal-on mode.

- The suspend mode occurs when sw1 is at low level. (by IC801 pin3)
The B^+ (+15V) is switched off via Q206, Q201. At this condition, Q206, Q201 are all turn off.
The +15 disappear at Q201 collector. The B+ (+12V) are switch off via IC406.

- The power-off mode occurs when sw1 and sw2 are at low level.
Both B^+ (+15V) and 6.3V are switched off via Q201, Q206, D206, IC103, Q115 respectively.

The micro-processor IC801 is driven to power off mode when signal cable is not connected to PC.

6.3 MICRO-CONTROLLER UNIT (MCU)(IC801)

IC801 is an 4-bit micro-controller (WT60P1) with 16K byte ROM memory, which play a main role of the digital control monitor. It performs as mode timing detector, key control scanner and controller, DPMS power saving handling, on screen display programmer and auto-alignment geometry controller. Pin19, 20, 21, 29 are for key control. Pin9, 10, 11, 12, 15, 16 are for s-correction switch control. Pin39, 40 are for Horizontal and Vertical sync. Input respectively. Pin32, 33 is the V-sync. and horizontal sync then output to IC401 pin38, 33. Pin26 (SDA1) and pin27 (SCL1) are series data and clock (CKL) input for IC604 (OSD) IC601 (VIDEO). Pin27, 26 are also serial clock and serial data (SCL, SDA) bus communicate with IC802 (EEPROM) pin6/5. Pin24 (DDC/SDA)/25 (DDC/SCL) are as a port to communicate with alignment fixture/DDC 1/2B accessed by signal cable.

Pin2, 3 are DPMS power saving handling. They are both active at Low level when DPMS is achieved. The truth table of DPMS is listed below.

Pin2 (OFF)	Pin3 (Suspend)	DPMS
0	0	POWER OFF
0	1	SUSPEND
1	0	STAND BY
1	1	NORMAL ON

"0" means Low Level
"1" means High Level

Pin14 functions as Frequency Divider output. It will provide divided-by frequency according to input horizontal frequency. The cut-in frequency is 70KHz.

The horizontal frequency (means horizontal sync.) is derived from signal cable.

Pin30 functions as D/ FV output. It will provide PWM output and get dc voltage from R833 and C822 filter. The D/ FV output voltage is proportional to horizontal sync. (horizontal frequency)

Pin38 functions as B+/FV output. It also perform a same function as Pin30. D/FV is provided for Horizontal Driver Circuit. B+/FV is provided for scan B+ circuit.

Pin35, 36, 37 are functions as H-size, H-Linear, Tilt output controller, respectively.

Q804, Q805 is totem-pole stage between Hsync-Out of IC801 Pin33 and Hsync-In of IC401 Pin38.

Pin17, 18 are also active low immediately while mode change take place.

The purpose of Pin17 is to mute scrambling picture while mode change take place.

The purpose of Pin18 is to decrease scan B+ output surge voltage while mode change take place.

The theory of circuit will be discussed on portion of Horizontal scan and H.V generator. The truth table with regard to CS switch is shown as table 1.

Table 1.

	VESA 1600×1200 @75	VESA 1280×1024 @85	VESA 1280×1024 @75	MAC 1152×870 @75	VESA 1024×767 @85	VESA 1024×768 @75	VESA 832×624 @74.5	VESA 800×600 @75	VESA 640×480 @75	VESA 640×400 @70
CS6	1	1	1	1	1	1	1	1	1	0
CS5	1	1	1	1	1	1	0	0	0	0
CS4	1	1	1	1	1	0	1	1	0	0
CS3	1	1	1	0	0	1	1	0	0	0
CS2	1	1	0	1	1	1	0	1	0	0
CS1	1	1	1	0	0	0	1	0	0	0

6.4 SYNC. PROCESSOR

The horizontal sync. is connected from signal cable to IC801 (MCU) pin39 input and from IC801 pin33 delivers positive polarity sync through totem-pole Q804, Q805 to IC401 pin38.

Vertical sync. is connected from signal cable to IC801 (MCU) pin40 input comes out at pin32 a positive polarity sync to IC401 pin33.

The IC801 (WT60P1) and the IC401 (TDA9106) sync input can handle either composite or separate sync input.

6.5 DEFLECTION CIRCUIT

6.5.1 Horizontal Phase Shifter :

This function is operated by a part of circuit inside IC401 (TDA9106). The picture phase adjustment is controlled by wide range I^2C controller. The phase shifter ensures a constant position of the shaped flyback signal in comparison with the sawtooth of the VCO. The phase comparator is followed by a charge pump with +/- 0.5mA (typ.) output current. The H-phase adjustment range about +/- 10% of horizontal period. The determining factor is C413.

6.5.2 Horizontal and Vertical Synchronization Processing

The horizontal synchronization processor is integrated inside the chip of TDA9106(IC401). It uses a dual phase-lock-loop (PLL1/PLL2) design. This operation ensures a smooth tuning and avoids fast changes of H-frequency during catching.

The processor can synchronize with the input sync. up to 4.5 times of free-run frequency which is determined by R405 and C408. Two VCO filtering is connected at pin8 (VCO Low Threshold) and pin9 (VCO High Threshold).

The PLL1 phase detector circuit is used to control the oscillator frequency and maintains it in proper frequency and phase with the incoming sync signal. One input is coupled from output of VCO which is built inside the IC. The PLL1 section also includes a Lock / Unlock identification function which senses in real time whether PLL1 is lock on the incoming horizontal sync. signal or not.

A loop filter with a properly selected time constant (C410, C409, R406) is connected at pin12. A Lock / Unlock filter with properly cap. (C412) is connected at pin13. A high level on pin13 which forces Hlockout (pin37) to low level. hysteresis comparator detects locking when pin13 is reaching 6.5V and unlocking when pin13 is decreasing to 6.0V. The difference between lock / unlock permits a smooth catching of horizontal frequency by PLL1. This effect is reinforced by an internal original slow down system when PLL1 is locked avoiding Horizontal too fast frequency change. The lock / unlock information provided by pin37 will functions as slow down protection to immunize surge voltage of Buck-Converter output.

The PLL2 circuit is used to compare the line flyback pulse at pin HFLY with the oscillator sawtooth voltage, to compensates the delay in H-deflection by adjusting the PHASE of HDRV. One input is from the output of VCO (which is inside the IC) and a second input (pin6 of IC401) is coupled from pin1 of T405 (Dummy Load X'FMR) Via R403, R404, C404 and C405.

The control voltage formed through loop filter is to control horizontal output pulse at proper duty cycle and maintain the phase between raster and picture.

The determined factor of Hor. Moire canceling are R401, R402. The moire output is intended to correct a little between horizontal video pixel period and actual CRT pixel width. To achieve a moire cancellation, it has to be connected to any point on the chassis controlling the horizontal position. The amplitude of the signal is I2C adjustable.

The H/V sync. processor (IC401, TDA9106) delivers an horizontal parabola wave form on pin17. This parabola is performed from a swatooth in phase with flyback pulse. This swatooth is present on pin16 where the horizontal focus capacitor is the same as C408 (Cosc) to obtain a controlled amplitude. (from 2 to 4.7V typically). Symmetry (keystone) and amplitude are I2C adjustable. This signal has to be connected to the CRT focusing grid and mixed with vertical dynamic focus. The vertical dynamic focus is also delivered by IC401 pin32. No adjustment is available for this part except by means of tracking.

The dynamic focus circuit theory to be discuss on the following paragraphs of "Focus".

The H/V sync. processor (IC401, TDA9106) delivers an horizontal sync on pin36. This horizontal sync. through R861 and C860 to IC804 to perform monostable output. IC804 pin13 provide clamp pulse to Video Board.

The H/V processor (IC401, TDA9106) vertical part include vertical ramp (pin29), vertical position (pin28), vertical REF (pin26), AGC Loop (pin25), Vertical Blanking (pin23) and a parabola shaped current genereetor for E/W correction (pin31). It is also including dynamic focus output.

The capture range of vertical frequency depends on the external capacitor connected on pin27.

Good stability of the internal closed loop (for AGC) is reached by a 470nF ±5% capacitor value on pin25. Pin30, Vfly is the vertical flyback input used to generate the vertical blanking signal on pin23 (VBLK).

Both VBLK (pin23) and HBLK (pin22) are delivered to Video Board for O.S.D fast blanking usage.

The H/V processor (IC401, TDA9106) belong to I2C controlled device family, instead of being controlled by DC Voltage on dedicated control pins, each adjustment can be realized through the I2C Interface. The I2C bus is a serial bus with a clock (SCL pin40) and a data (SDA pin41) input.

The horizontal drive pulses are sent from pin21 of IC401.

6.5.3 Horizontal Driver Stage

The horizontal drive pulse is applied to the totempole ; Q443 and Q444 then via R472 to the gate of driver transistor Q445. B^+ is provided by the regulated 15V voltage source via R475, R476, R477, Q446, Q447 and C451. The output of driver transformer T404 is coupled to the base of horizontal output transistor Q448. C452 and R479 compose of damping network which is to eliminate the leakage flux of T404 during Q445 turns off. Resistor R475, R476, R477 and transistor Q446, Q447 functions as Driver/F to V inverting amplifier to compensate Q448 IB1 current of High/Low frequency. The output voltage of Drive/F to V is shown as tablet 2.(For reference only)

Table 2.

Mode	Q447 (E)
1600×1200@75Hz	11.0 > Q447 (E)□10.2
640×400@70Hz	13.0 > Q44 (E)□12.6

6.5.4 Horizontal Scanning

The conducting period of horizontal output transistor Q448 completes the second half of scan. The conducting period of damper diode D440 completes the first half part of horizontal scan.

The retrace capacitor is C453, the charge and discharge actions of retrace capacitor via yoke after Q448 turned off, which is designed for the same resonant frequency with the main scan circuit.

6.5.5 Buck Converter

In order to maintain same scan width within 30K-95KHz, the scan supply B+ tracked with continuos H-frequency is necessary, and the design is implemented by a convention method of buck converter tracking with B+/F to V circuit.

The buck converter mainly composes of a n-channel MOSFET (Q441) Diode (D437), X'FMR T401, choke L431 and capacitor C447.

The buck converter control signal derived from PWM control circuit. The PWM control circuit play an important role in the B^+ scanning type circuit structure. The PWM control circuit perform following functions□ ① Signal fetching synchronization with horizontal sync. ② H-width control and E-W pincushion correction modulation. ③ DC and AC feedback compensation. ④Scan B^+ tracking with B^+/F-V.⑤ Softstart and lock-out protection. Each function block consist of several key components.

(1) Signal fetching and synchronized with horizontal sync□
R430, R431, R432, R433, R435, R436, C430, C432, Q430 and Q431 composed of signal fetching and synchronized with horizontal sync.

(2) H-Width control and E-W pincushion correction modulation□

R441, C436, R442, C0420, R0436, R0432 and scan B^+ setting VR402. The H-width adjustment is based on Scan B+ setting. Presetting H-Width to adjust VR402 to minimum screen width at 31K. E-W pincushion correction signal is provided by IC401 pin31 and then pass through C437 and R446 to IC403 pin6.

(3) DC and AC feedback compensation□

DC feedback are R0403, D460, C0403, R0431 and C0431. The DC feedback loop pass error signal fetch from T405 pin1 to error Amplifier IC403 (NE5532) pin3. The purpose of DC feedback loop is to compensate H-Width deviation due to temperature drift.

AC feedback are D461, C0434, R0434, C0435 and R0435. The main performance of AC feedback is to correct corner distortion which caused by L431 and C447.

(4) Scan B^+ tracking with B^+/F to V are R853, C823, R419, Q403, Q401, R407, R408, R478, R429 and R443. The circuit function of scan B^+ tracking with B^+/F to V is to get linear H-Width adjustment range from low frequency side to high frequency end. The B+ F to V output is shown as table 3. (For reference only)

Table 3.

Mode	Q401 (E)
1600×1200@75Hz	12.0V > Q401 (E)□11.0V
640×400@70Hz	6.0V > Q401 (E)□5.0V

(5) Softstart and lock-out protection are D432, D433, Q434, Q435, C441, R456, D434 R452, R454 and R457. The protection characteristic is considered from viewpoint of power on delay to avoid surge current or voltage adding to horizontal output transistor Q448 directly. The softstart and lock-out protection is initiated at high level from Hlockout of IC401 pin37 or scan mute of IC801 pin18 during power on/off or sync. disappear.

6.5.6 TRAPEZOID CONTROL / PARALLEL CONTROL / PIN BALANCE CONTROL

Trapezoid control / parallel control / pin balance control are all integrated in IC401. All the function are controlled by I^2C bus through MCU(IC801).

6.5.7 MODULATED HIGH VOLTAGE POWER SUPPLY CIRCUIT

IC402, Q0401, Q0402, Q0403, Q0408 and Q0404 peripheral circuit component is a high voltage regulation control circuit. Pin6 of IC402 is PWM pulse to drive gate of Q0404. The output of Q0404 is applied to the primary winding of flyback transformer (FBT T402) and drives the FBT to supply CRT anode voltage of about 26KV by stepping up FBT during retrace period. Pin4 of FBT supply -180V to G1 circuit.

Q734, D733, R731, R732, R733, R734, R735, R736, D732, ZD703, C732 are designed for over beam current protect. When beam current over 1200ua pin1 of IC402 will be driven through Q404, Q405 and R499 to shut down. Q404, Q405 and R499 are both used for over beam current protection and X-RAY-Radiation protection purpose. A softstart protection is also provided by R0409, C0404, D0403 and Q0403.

6.5.8 X-RAY-RADIATION PROTECTION

The X-Ray-radiation protection circuit used in this monitor is a latching type. When a fault occur which would cause the high voltage to increase above a predetermined level, the positive pulse at pin5 of the FBT (T402) would go more positive. This action in turn would increase the voltage applied to Q405 base to exceed its breakdown voltage for a certain time. A SCR latch (by Q404 and Q405) switches the IC402 into protection mode. Shutting down the drive pulse.

NOTE: The X-RAY-Radiation protection circuit used in this monitor is a latching type. The monitor will shutdown and continue until turn-off the monitor with power switch. Pin5 of FBT supply 32V to X-RAY protection circuit. The D735, C734, R737, R742, R738, R739, ZD702 and C735 are designed for X-RAY protection.

6.5.9 Vertical Deflection (IC501)

Vertical deflection function is operated in the chip IC401(TDA9160), IC501 (TDA8172) which mainly contains the oscillator, ramp generator, power output amplifier and flyback generator. The vertical sync signal is applied to the pin33 of IC401. Once the sync signal synchronized, a clock pulse is generated inside this chip. The clock pulse is just as a sync input of ramp generator. A liner voltage ramp is produced at pin29 of IC401, and is coupled to IC501 pin1 for vertical output amplitude. Vertical output amplitude is controlled by I^2C register of IC401 through MCU (IC801).

Pin5 is the outputs of the power amplifier and it drives the yoke by a current driven in opposite phase current ramp. R512 (damping function) is used to stabilize the power amplifier. Pin2 and pin4 are the supply voltage ±13VDC, pin6 is the flyback supply voltage which provide a blanking signal for the CRT. Pin3 is the feedback input (feed back to the input stage).

Vertical centering is controlled by changing the DC voltage at vertical output that is derived from the DC shift of IC401 pin28, and that can be adjusted by I^2C register of IC401 through MCU (IC801).

6.5.10 FOCUS

Horizontal parabola waveform from the IC401 pin17 delivers to drive Q905, Q903, Q901, Q902 & via T901 coupling to FBT pin12. Vertical parabola wave form is taken from IC401 pin32 and amplified by Q904 via T901 to FBT pin12. Q904, Q905 is cascade amplifier to drive FBT pin12 Via T901. T901, X'FMR is voltage amplifier with 1 : 15 turn ratio. Composite horizontal and vertical parabola waveform are obtain from pin12 of T402 (FBT). The amplitude of Hor. and Vert. are 370Vp-p and 170Vp-p, respectively.

6.5.11 Blanking CKT

IC401 pin23 Vertical blanking pulse are inverted by Q402 and then fed to the base of Q705 through C711 and R714. The blanking pulse is coupled to G1 by C703. The

output of G1 is fed to CRT PCB through R659 to CRT G1. While mode change, IC401 pin37 and IC801 pin17 will be pulled high to turn on Q712 (lock-out and mute function) and Q711 will be turn off. The G1 volt will be down to –130V then cut off the CRT video output. Horizontal blanking pulse is fed to IC601 pin27 and let video O/P Amp set cut off during the period of horizontal retrace. Horizontal blanking pulse (HBLK) is fetch from the voltage divider of C0474 and C0475.

6.5.12 Rotation

Rotation CKT is operated a volt difference on rotation coil. The IC801 pin37 delivers 0~5V to IC701 pin3 to control the volt amplitude and polarity on IC701. IC701 pin1 via Q701, Q702 drive rotation coil. A +7V voltage also apply to differential end of rotation coil.

6.6 VIDEO

6.6.1 VIDEO AMPLIFIER(IC601)

The video amplifier module is composed of three amplifiers for red, green, blue channel.

The video input signal is fed to the video preamplifier IC501(M52743ASP) (pin2 blue, pin6 red, pin11 green) through AC coupling capacitor C671/C691, C672/C696, C673/C679.

The clamping pulse comes from IC804 pin13 via P604 pin1 to IC602 pin19 for dc restoration.

IC603 is an integrated high voltage CRT driver circuit that is designed for driving B.R.G channel of CRT.

6.6.2 On Screen Display (OSD)(IC603)

IC604 is an on screen display generator IC604 Pin5 is for HBLK input which derived from IC401 pin22 and P604 pin8. IC604 pin10 is for VBLK input which derived from IC801 pin32/31 and P604 pin7. The IC604 is controlled by IC801 I^2C bus to IC604 (pin7, pin8).

The on screen display signal is output from pin15(R). Pin14(G), pin13(B) and is connected to mixer circuit of IC601 pin4, pin9, pin13.

6.6.3 Auto Beam Limit CKT (A. B. L. CKT)

When beam current is over 800ua by VR702, the voltage build at base of Q734 will be low enough to turn on Q734, then the voltage at pin15 of IC601 will be pulled down accordingly to reduce the video preamplifier gain output.

6.6.4 Brightness Control

Brightness is controlled by varying the DC voltage of G1 with the IC601 pin23 (DAC4, P603 pin1). The DAC output provided to IC701 pin3 through R718, C715. The G1 voltage is controlled by varying the dc bias of Q711.

4.6.5 CONTRAST, GAIN & BIAS CONTROL

The IC601 (M52743ASP) contains three gated single ended input black level clamp comparator for brightness control, three matched DC controlled attenuators for contrast control, and three DC controlled sub-contrast attenuators providing gain trim capability for white balance.

All the DC control voltage comes from IC601 M52743ASP internal (DAC) which is controlled by IC801 micro controller via a I^2C bus (IC801 pin26, pin27). The IC601 DAC output from pin24, 25, 26 are for G.R.B (BIAS) controller.

6.6.6 DDC1/2B(IC802)

Our monitor will provide EDID data though DDC1/2B interface. The EDID data can be offered by MCU or 24LC21. If you want to use whichever, you must set configuration byte at EEPROM. The configuration byte defines in below table. Maybe your system cannot read EDID from monitor because your system does not follow VESA'S recommendation to process data protocol. However you still can use 24LC21 to solve this problem.

ADDRESS	CONTENT				
3FE	Complement [Bit 3~0]	RESERVE	RESERVE	EDID	BURNING

EDID : 1=>need 24LC21 IC, 0=>need not 24LC21

Adjusting Procedure

A. GENERAL

B. INSTRUMENT ALIGNMENT

1. Deflection Presets
2. Power Supply Alignment
3. Size & Geometry Adjustment
4. Video Alignment
5. Focus adjustment
6. Power management tests
7. DDC test
8. Timing of input signals

C. PCB DEFINED

D. FACTORY MODE ADJUSTING PROCDURE FLOW CHART

A. GENERAL

1. All specification must be met over line voltage range of 90vac to 264vac 50Hz / 60Hz, unless otherwise specified.

2. Operating temperature range is 0℃ to 35℃ with a relative humidity of 10% or less to 80%.

3. The monitor must be operational in a usable state within 30 minutes after turn-on.

4. All signal levels are measured assuming termination at the monitor's input jacks or in its characteristic impedance.

5. An ambient lighting level of 400 to 600 Lux is assumed when setting brightness for raster extinction threshold.

6. All purity related specifications must be met without external degaussing.

7. All controls must have excess range (no control may be left at an end stop when proper alignment is completed).

8. The monitor is not required to meet specs during the following but must tolerate, without damage to the CRT or circuits, any sequence or combination of power on and off, signal on and off, unplugging of power or signal, erratic, wrong frequency or noisy inputs while at any possible settings of user accessible controls likewise, the monitor should survive extended periods of operation with line voltage reduced below the specified minimum.

9. An isolation transformer should be used when performing alignment and tests. Portions of the power supply board are hot ground. The remaining boards are cold ground.

10. Discharge of CRT anode should be done only to CRT ground strap.

11. Geometric measurements are assumed to be made along a straight surface with a flat rule or template.

B. INSTRUMENT ALIGNMENT

1. Defection Presets

   Control pots VR401, VR402, VR403 are set at middle point. Screen, Focus VR set to min.

2. Power Supply Alignment

   2.1 Input VGA (480) signal & beam current set at 0μA.

   2.2 Adjust VR201 until voltage at TP003 (or J134) =180±0.5V

   2.3 Adjust VR402 until voltage at TP002 (or J142/J143)=42 $^{+0.1V}_{-0.3V}$ (SAMSUNG).

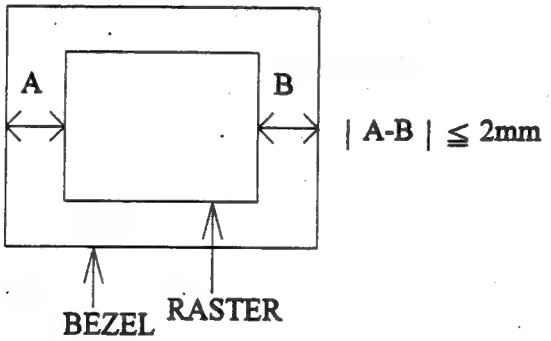
3. Size & Geometry Adjustment

   3.1 Raster Centering

   3.1.1 Input cross hatch pattern at 60K 1024*768 75Hz mode.

   3.1.2 Adjust contrast to 10FL, adjust screen just raster visible.

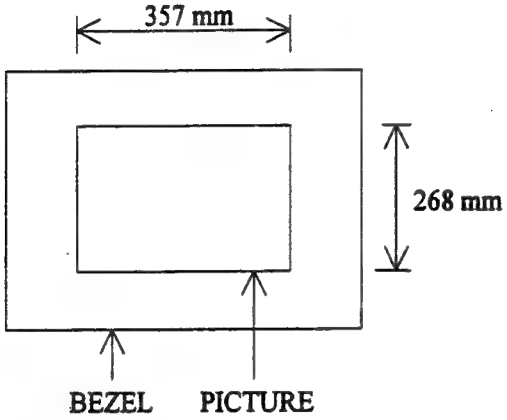
   3.1.3 Adjust VR403 to center raster on screen such that the horizontal distance from the midpoint of the left display edge to the left bezel edge is within 2mm of the distance from the midpoint of the right display edge to the right bezel edge.



3.2 Picture Size

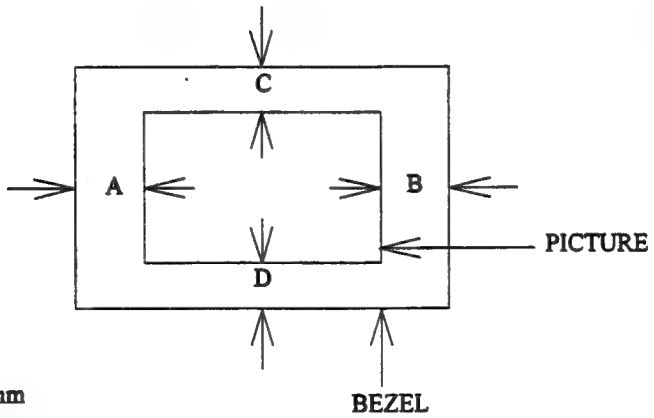
Input Preset mode signal adjust "V-SIZE, H-SIZE" to achieve

H-SIZE : 357mm ± 2mm
V-SIZE : 268mm ± 2mm



3.3 Picture Centering

Input preset mode adjust V-position, H-position such that the picture is centered with the screen. screen.

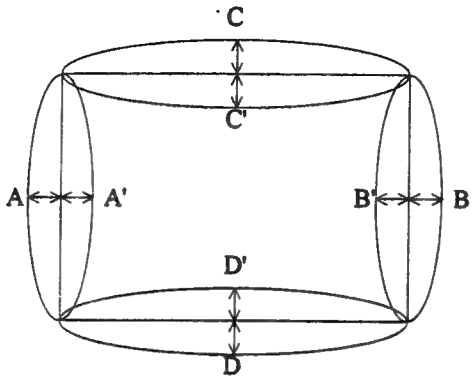


| A - B | ≦ 2mm
| C - D | ≦ 2mm

3.4 Geometry Adjustment

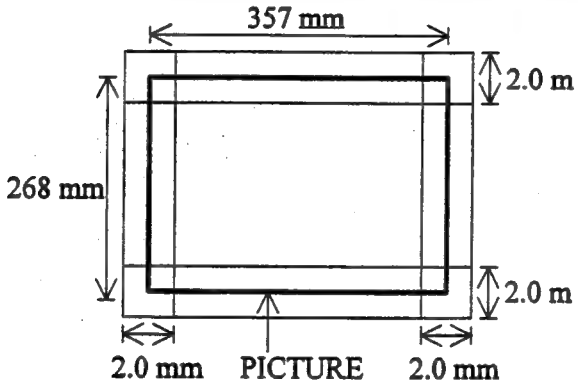
3.4.1 Input preset mode

3.4.2 Pincushion and barrel distortion

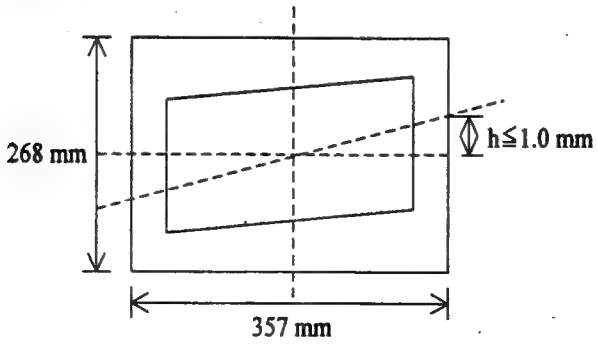


PINCUSHION ≦ 1mm (A',B',C',D')
BARREL ≦ 1mm (A,B,C,D)

3.4.3 Trapezoid and parallelogram distortion trapezoid / parallelogram ≦ 1.5mm.



3.4.4 Rotate adjustment



4. Video Alignment

4.1 Input 1024x768 60KHz full black pattern.

4.2 Turn the G2 (VR) knob to obtain 550±10V at G2 (near by R660) on Video board.

4.3 Set Brightness 100%, Contrast 0%, turn the VR701 knob to obtain raster light O/P about 0.3 FL

4.4 Adjust R.G.B bias Control to meet following chromaticity spec.

9300° K → x = 0.281±0.02 , y = 0.311±0.02 , Y = 0.3±0.2 FL
6500° K → x = 0.313±0.02 , y = 0.329±0.02 , Y = 0.3±0.2 FL
5000° K → x = 0.346±0.02 , y = 0.359±0.02 , Y = 0.3±0.2 FL

4.5 Adjust Brightness to 50%, Contrast 100%.

4.6 Apply 70mmx70mm green window pattern, adjust G-Driver to obtain green window pattern light o/p about 32 FL (9300° K)

4.7 Apply white window pattern, adjust R-Driver, B-Driver to meet following chromaticity spec.

9300° K → x = 0.281 ± 0.003 , y = 0.311 ± 0.003 , Y = 42 ± 1FL

4.8 Apply 70mmx70mm green window pattern, adjust G-Driver to obtain green window pattern light O/P about 32 FL (6500°k)

4.9 Apply white window pattern, adjust R-Driver, B-Driver to meet following chromaticity spec.

6500° K → x = 0.313 ± 0.003 , y = 0.329 ± 0.003 , Y = 42 ± 1FL

4.10 Apply 70mm×70mm green window pattern, adjust G-Driver to obtain green window pattern light O/P out 32FL (5000°K)

4.11 Apply white window pattern, adjust R-Driver, B-Driver to meet following spec.

5000° K → x = 346 ± 0.003 , y = 0.359 ± 0.003 , Y = 42 ± 1FL

4.12 Apply full white pattern.

4.13 Adjust VR702 to obtain light O/P = 30 ± 0.5FL

4.14 Apply white window pattern (70x70mm) adjust contrast from max to 10FL and check the chromaticity meet following spec.

$$\left.\begin{array}{l} |\, x\,(\text{AT CONT, 30}) - x\,(\text{AT 10FL})\,| \leqq 0.010 \\ |\, y\,(\text{AT CONT, 30}) - y\,(\text{AT 10FL})\,| \leqq 0.012 \end{array}\right\} \text{ For 9300°K and 6500°K}$$

4.15 Check the percentage of R.G.B driver both 9300° K and 6500° K must between 20% to 90%.

5. Focus Adjustment

5.1 Apply signal ALL "mE" pattern at 60K (1024*768) at 75Hz mode.

5.2 Set Brightness 50%, Contrast 100%.

5.3 Set focus control for best focus.

6. Power Management Tests

6.1 Power consumptions test table:

Mode	Sync. Pulse			Power (W) (TCO)	LED	Recovery time (SEC) TCO
	Horizontal	Vertical	Video			
Normal On.	Yes	Yes	Yes	130W (93.5K) max	Green	—
Suspend	Yes	Yes	Blank	< 15W	AMBER	< 3
	Yes	No	Blank			
Off	No	No	Blank	< 3W		—

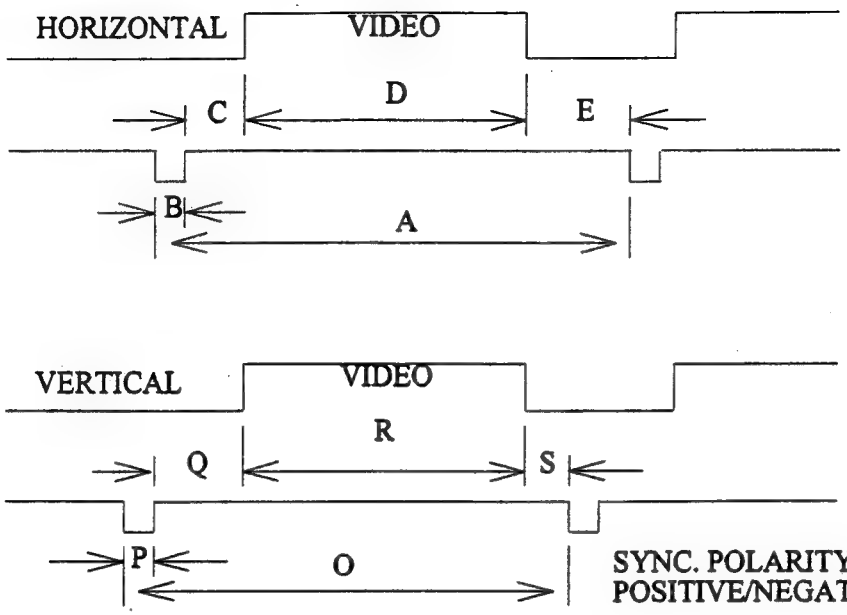
6.2 Test pattern : VESA 1600 × 1200/75Hz mode and flat white field.

7. DDC Test : Connects signal cable into DDC tester to program EDID data saved in EEPROM EEPROM (IC802).

7.1 The EDID data saved in EEPROM (IC802) should be same as specified in appendix DDC (Engineering Specification).

7.2 Each production unit should have its own serial number, week of manufacture and year of manufacture.

8. Timing of Input Signals



A : H-TOTAL TIME O : V-TOTAL TIME

B : H-SYNC PULSE WIDTH P : V-SYNC PULSE WIDTH

C : H-BACK PORCH Q : V-BACK PORCH

D : H-DISPLAY TIME R : V-DISPLAY TIME

E : H-FRONT PORCH S : V-FRONT PORCH

MAGNETIC FIELD FOR FACTORY ALIGNMENT

THE NORTHERN HEMISPHERE : VERT. 0.49 (GAUSS)

HOR. 0.00 (GAUSS)

THE HORIZONTAL MAGNETIC FIELD SET FOR PERFORMANCE CRT FACE EAST, WEST, SOUTH AND NORTH, WHEN CHECK TILT AND PURITY.

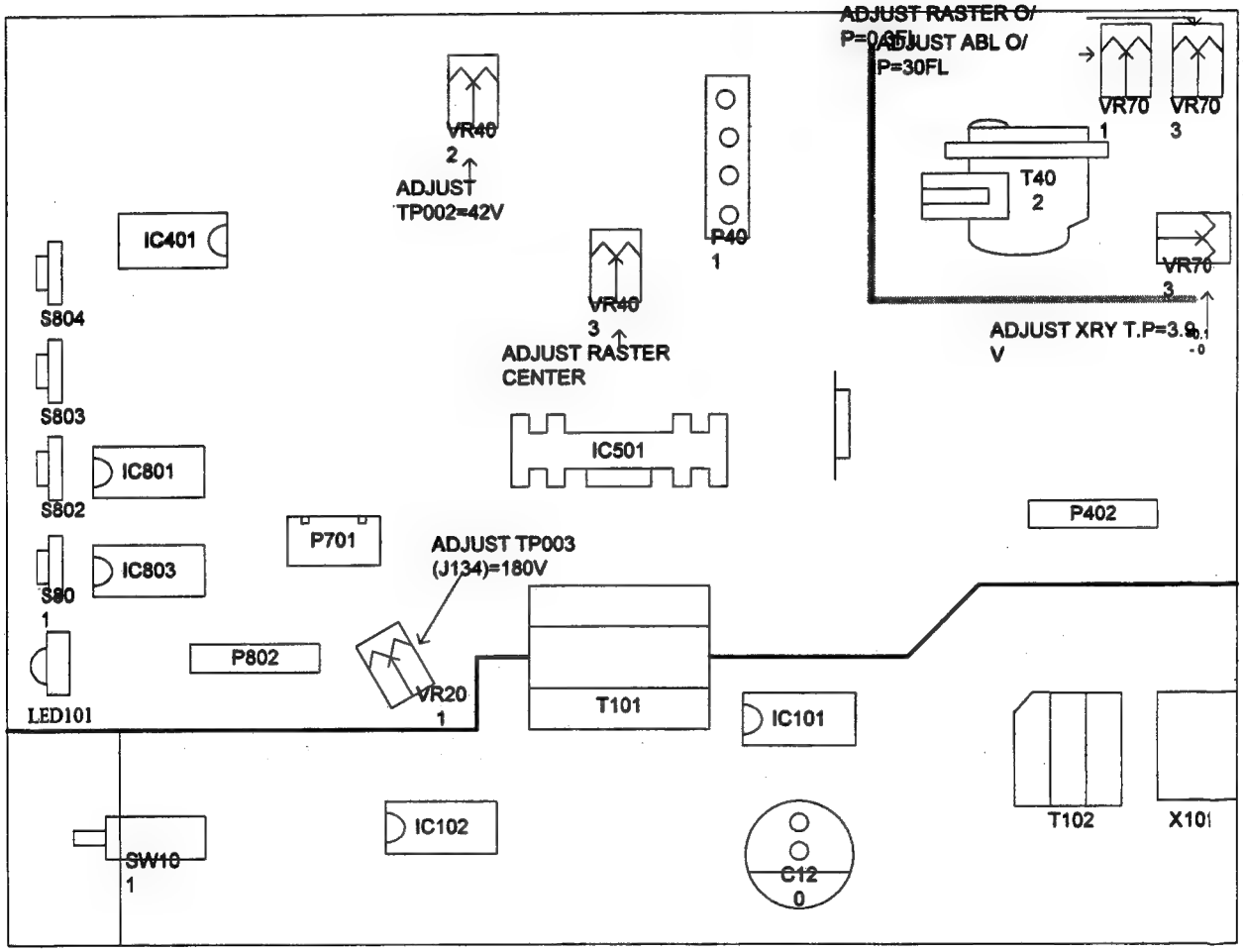
MODEL NUMBER	LOCATION	MAGNETIC REQUIREMENT
VCDTS21475-2M	NORTH AMERICA	Bh = 250mG ± 10mG , BV = 490 ±10mG

PRESET TIMING CHART

Mode No.	1	2	3	4	5	6	7	8	9	10
Mode Name	VGA 640X 400	VESA 640X 480	VESA 800X 600	MAC 832X 624	VESA 1024X 768	VESA 1024X 768	MAC 1152X 870	VESA 1280X 1024	VESA 1280X 1024	VESA 1600X 1200
PIXEL CLOCK (MHz)	25.145	31.5	49.5	57.2822	78.75	94.5	100	135.0	157.5	202.5
Horizontal Dots	640	640	800	832	1024	1024	1152	1280	1280	1600
Vertical Lines	400	480	600	624	768	768	870	1024	1024	1200
Horizontal Freq. (KHz)	31.47	37.5	46.875	49.717	60.023	68.677	68.681	79.976	91.146	93.750
Sync. Polarity	−	−	+	−	+	+	−	+	+	+
A H. Total (us)	31.778	26.667	21.33	20.115	16.66	14.561	14.560	12.504	10.971	10.667
B H. Sync (us)	3.813	2.032	1.616	1.118	1.219	1.016	1.280	1.067	1.016	0.948
C H. Back Porch (us)	1.907	3.81	3.232	3.911	2.235	2.201	1.440	1.837	1.422	1.501
D D. Active (us)	25.422	20.317	16.162	14.528	13.003	10.836	11.520	9.481	8.127	7.901
E H. Front Porch (us)	0.636	0.508	0.323	0.558	0.203	0.508	0.320	0.119	0.406	0.316
Vertical Freq. (Hz)	70.08	75.00	75	74.534	75.029	84.997	75.062	75.025	85	75.0
Sync. Polarity	+	−	+	−	+	+	−	+	+	+
O V. Total (ms)	14.268	13.333	13.333	13.417	13.328	11.765	13.322	13.329	11.761	13.333
P V. Sync (ms)	0.064	0.080	0.064	0.06	0.050	0.044	0.044	0.038	0.033	0.032
Q V. Back Porch (ms)	1.112	0.427	0.448	0.784	0.466	0.524	0.568	0.475	0.483	0.491
R V. Active (ms)	12.711	12.800	12.800	12.552	12.795	11.183	12.667	12.804	11.235	12.800
S V.Front Porch (ms)	0.381	0.027	0.021	0.021	0.017	0.015	0.044	0.013	0.012	0.011
Scan Type	MON INT.	MON INT.	MON INT.	MON INT.	MON INT.	MON INT.	MON INT.	MON INT.	MON INT.	MON INT.

C. PCB DEFINED

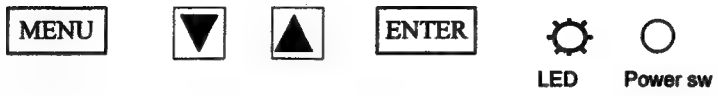
Main Board

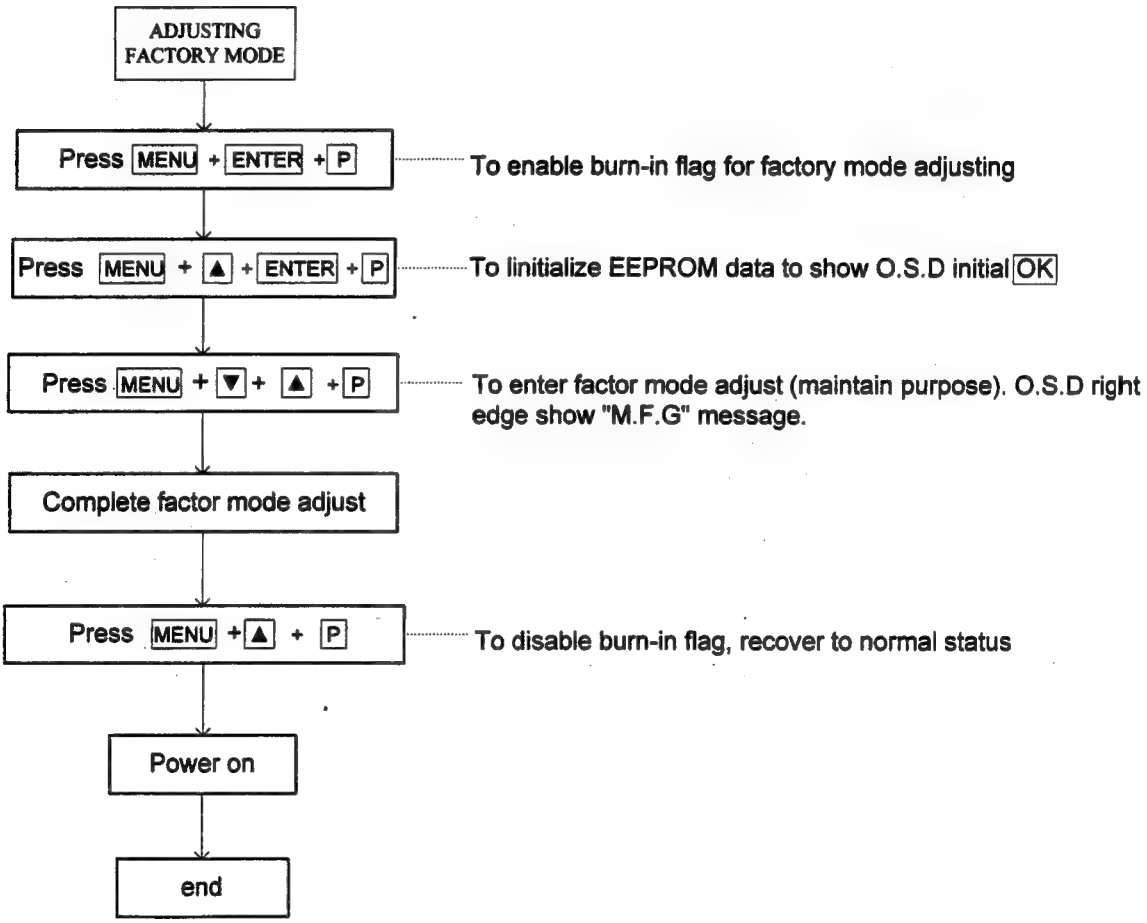


FACTORY MODE ADJUSTING PROCEDURE FLOW CHART

FACTORY mode adjust flow chart

Front panel function key



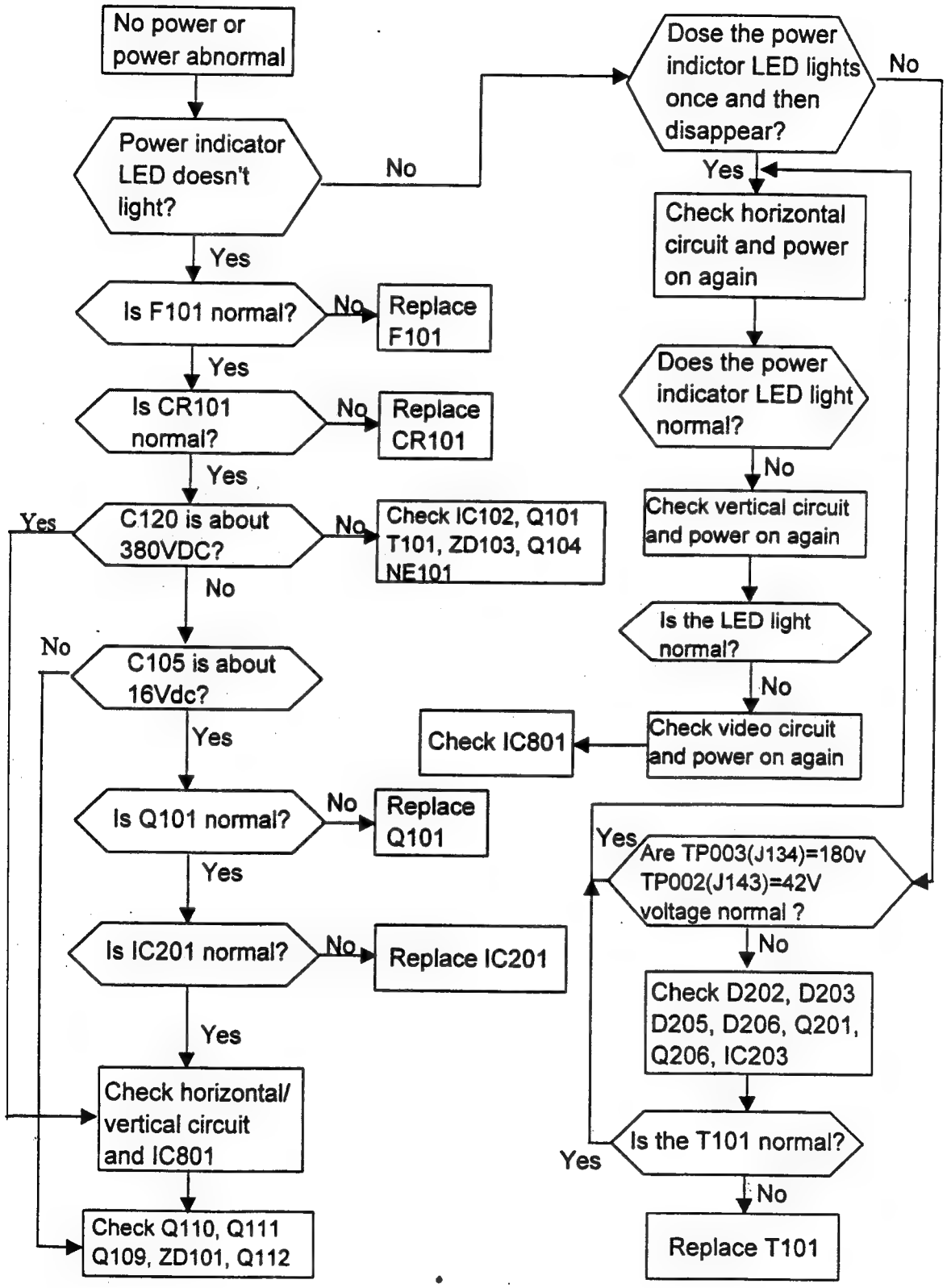


* Complete each step, should be power off and then proceed next step.

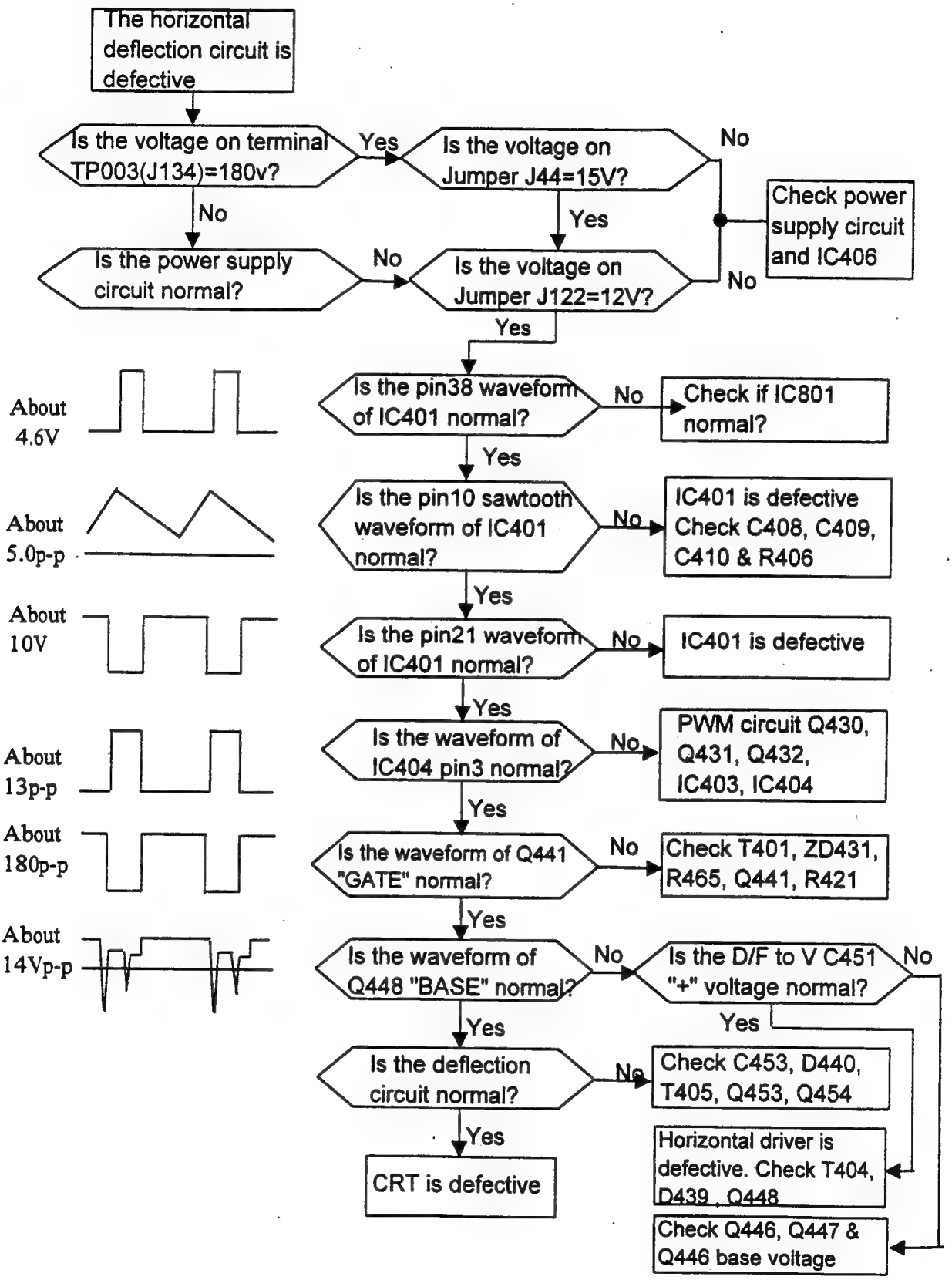
8.Trouble shooting flow chart

a. Power supply is defective
b. Horizontal deflection circuit is defective
c. Horizontal circuit is not defective yet abnormal
d. Vertical deflection circuit is defective
e. High voltage circuit is defective
f. The raster doesn't appear & spot in CRT
g. Video is defective
h. One color missing
i. OSD is defective
j. Dynamic focus circuit is defective

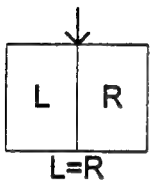
a.Power supply is defective

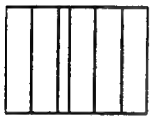


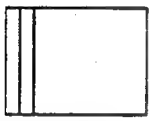
b.Horizontal deflection circuit is defective

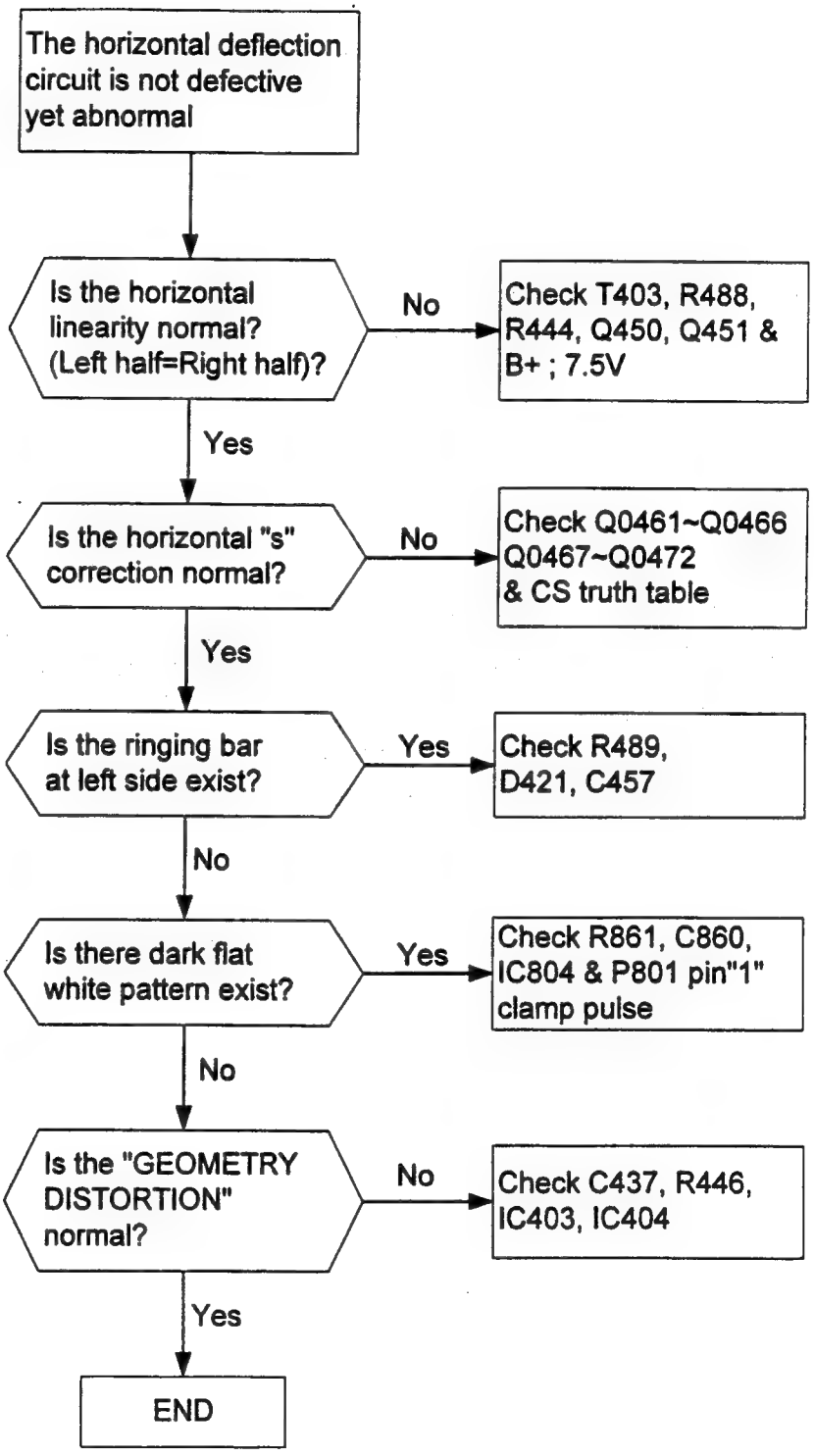


C. Horizontal circuit is not defective yet abnormal

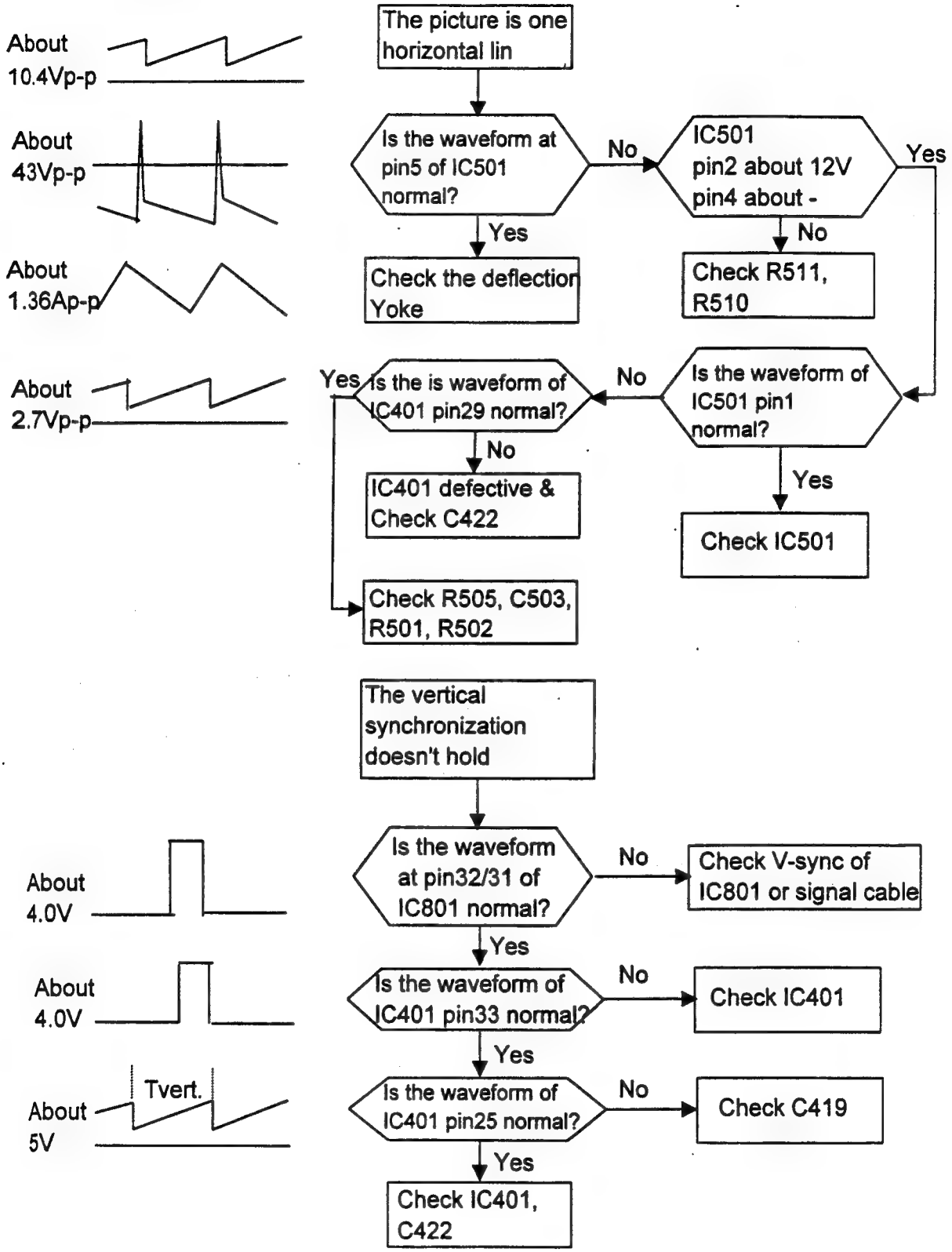




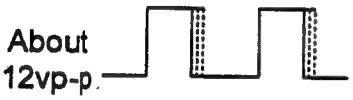


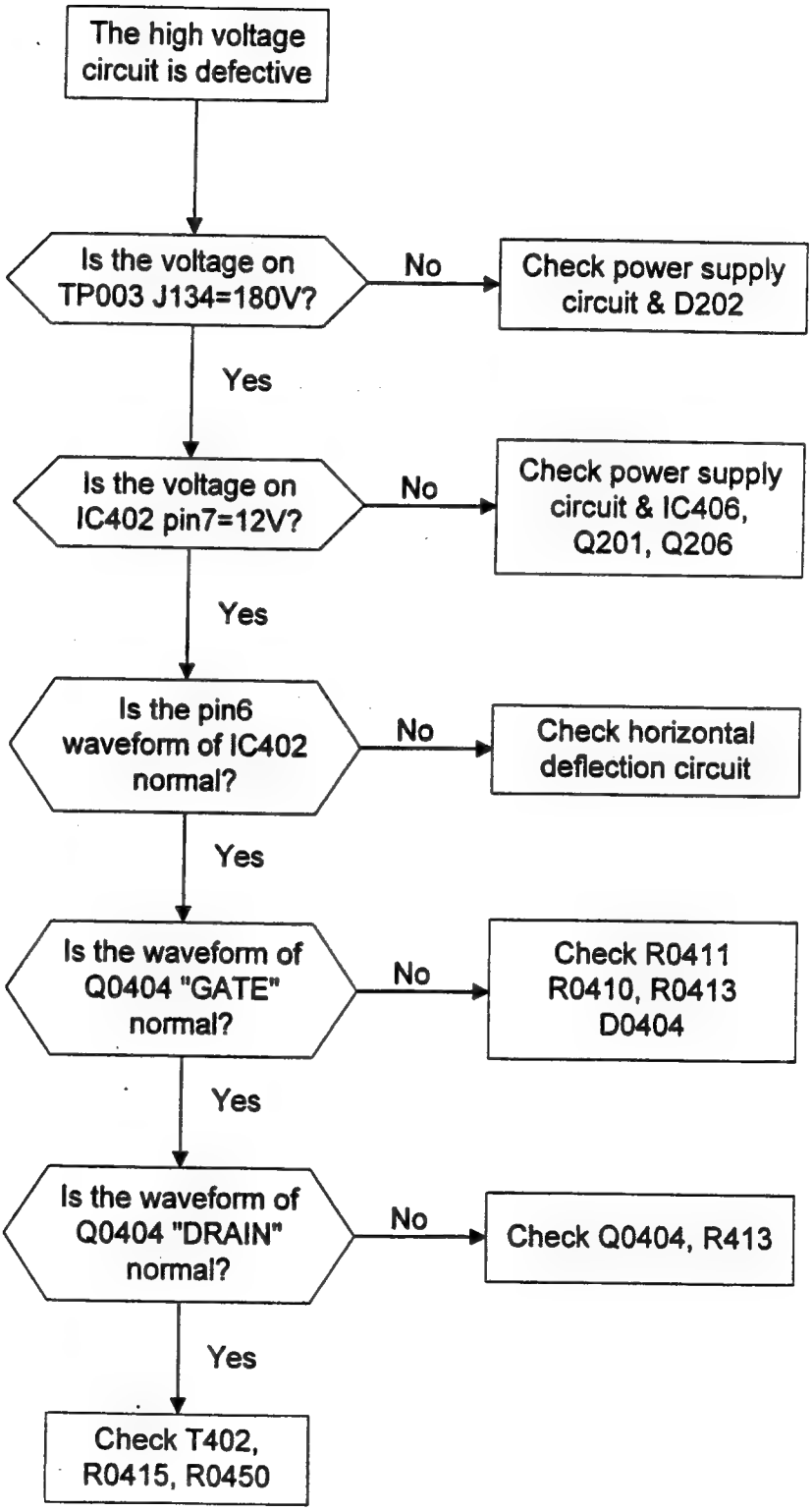


d. Vertical deflection circuit is defective

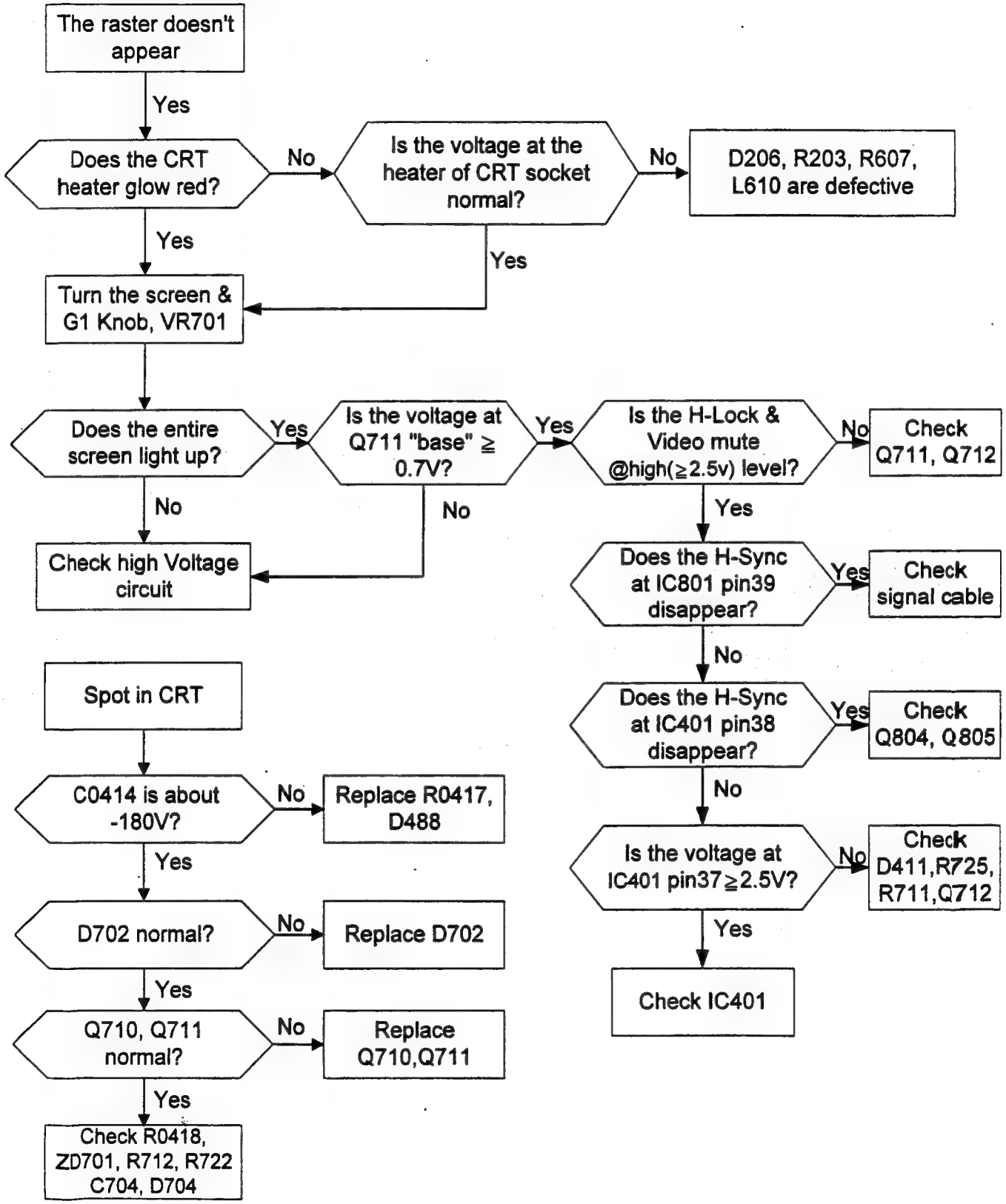


e.High voltage circuit is defective

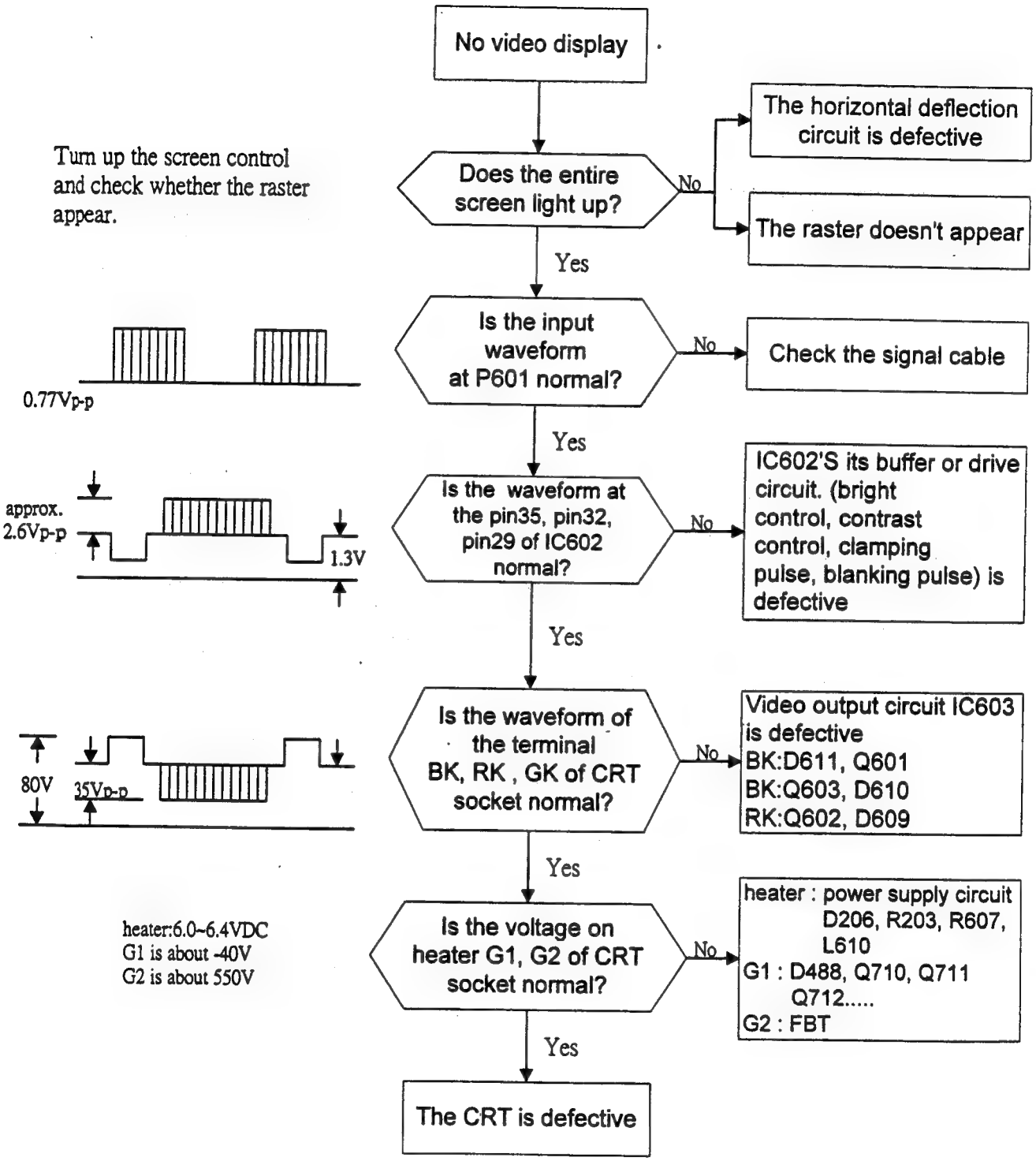




f.The raster doesn't appear & spot in CRT



g. Video is defective



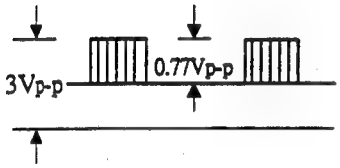
h.One color missing

One color missing

Is the waveform at P601 pin1, pin3 pin5 normal?

No → Check the signal cable

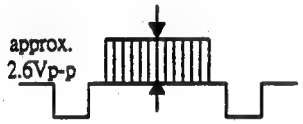
Yes



Is the waveform at IC601 pin2, pin6, pin11 normal?

No → Check C691, C671, C696, C672, C697, C673

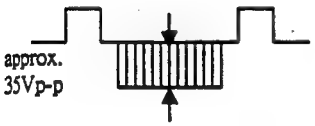
Yes



Is the waveform at IC601 pin35, pin32, pin29 normal?

No → IC601 is defective

Yes



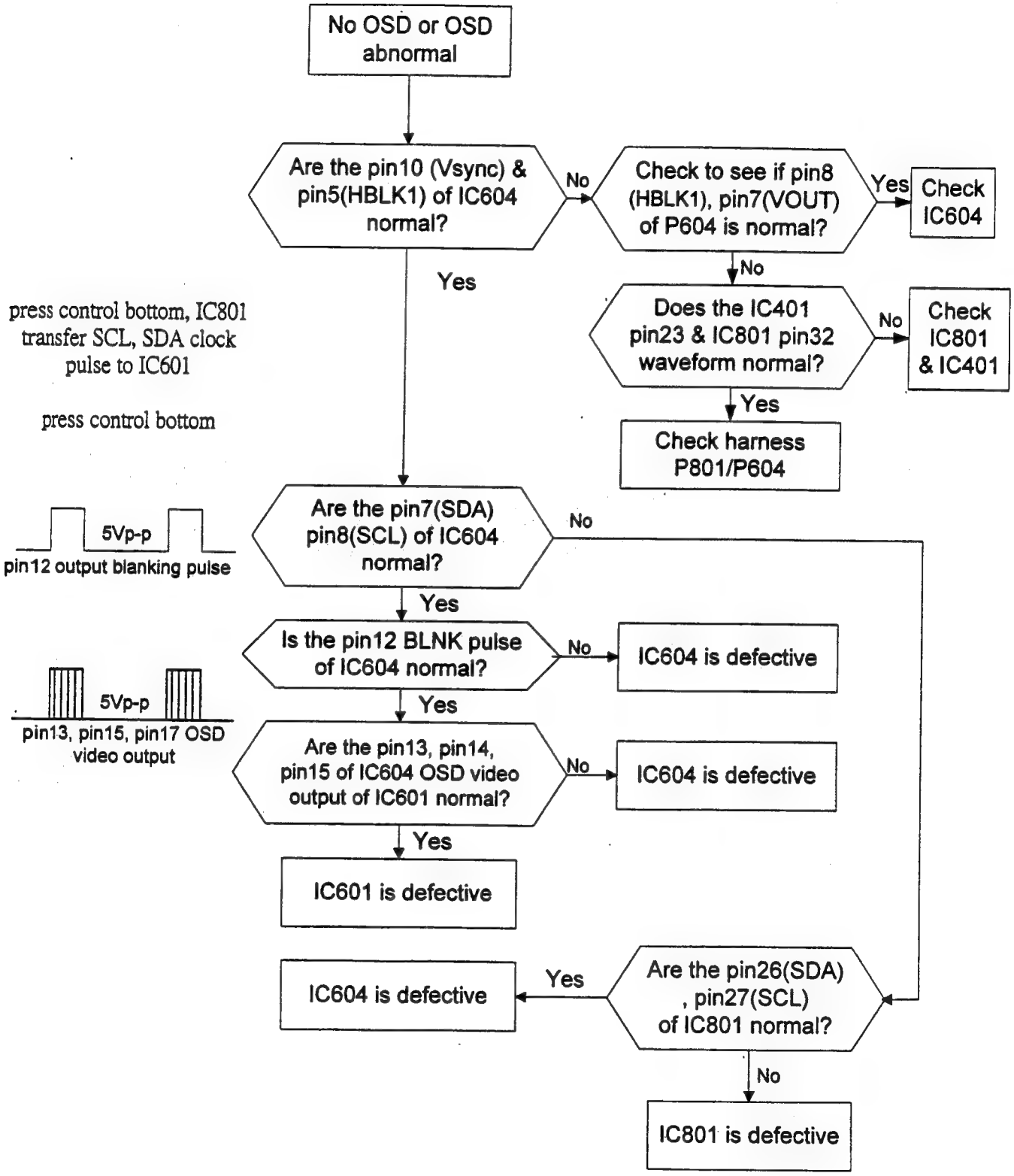
Is the waveform of the terminal BK, RK , GK of CTR socket normal?

No → Video output circuit IC602 is defective
BK:Q601, D611
RK:Q602, D609
GK:Q603,D610

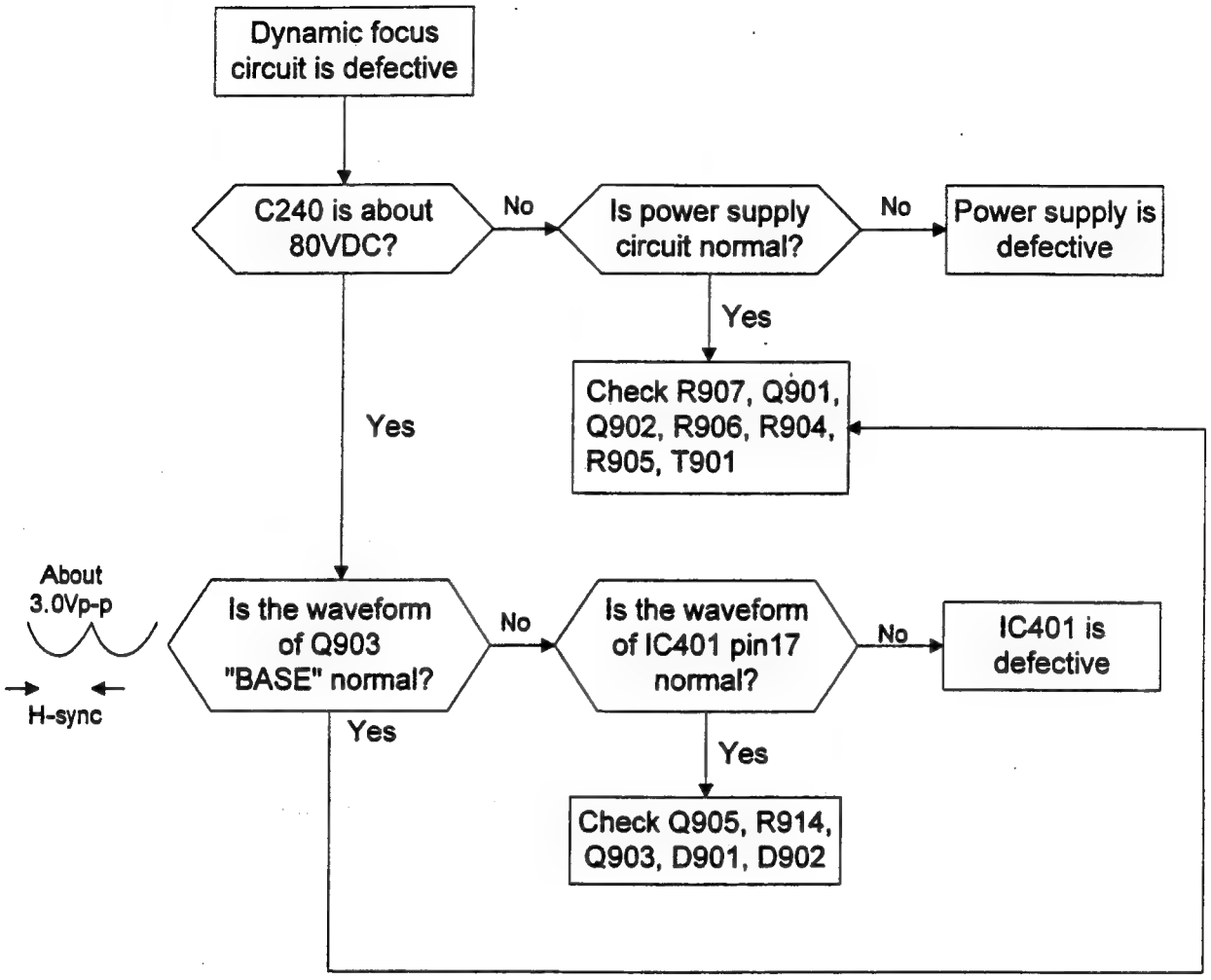
Yes

CRT is defective

i.OSD is Defective



j.Dynamic focus circuit is defective



9. Mechanical Assembly / Disassembly

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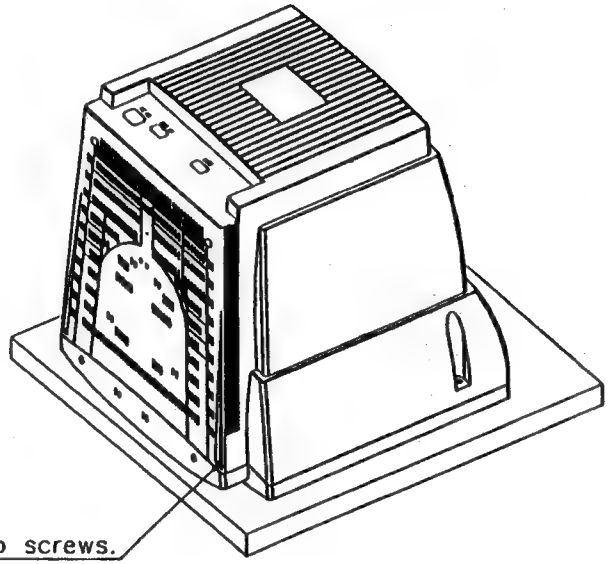
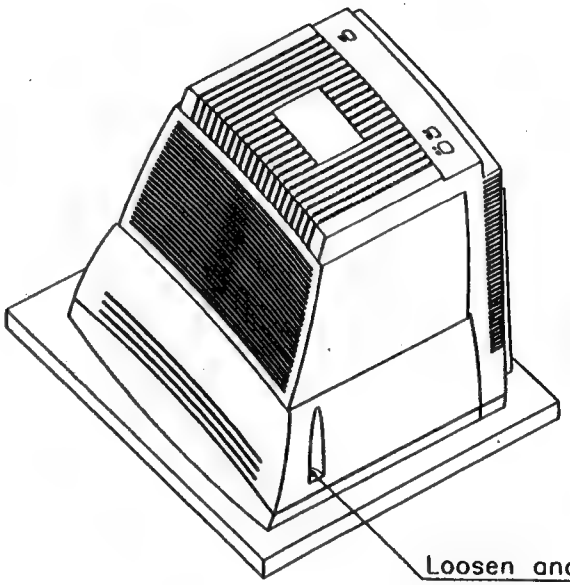


Loosen and remove two screws.



Loosen and remove two screws.

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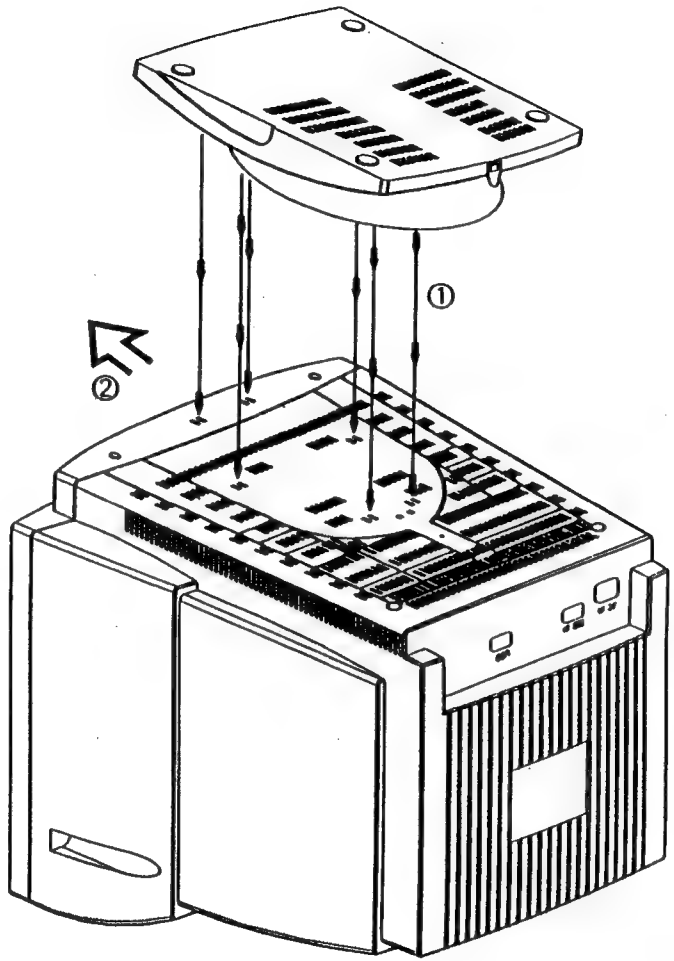

Viewing from up side down

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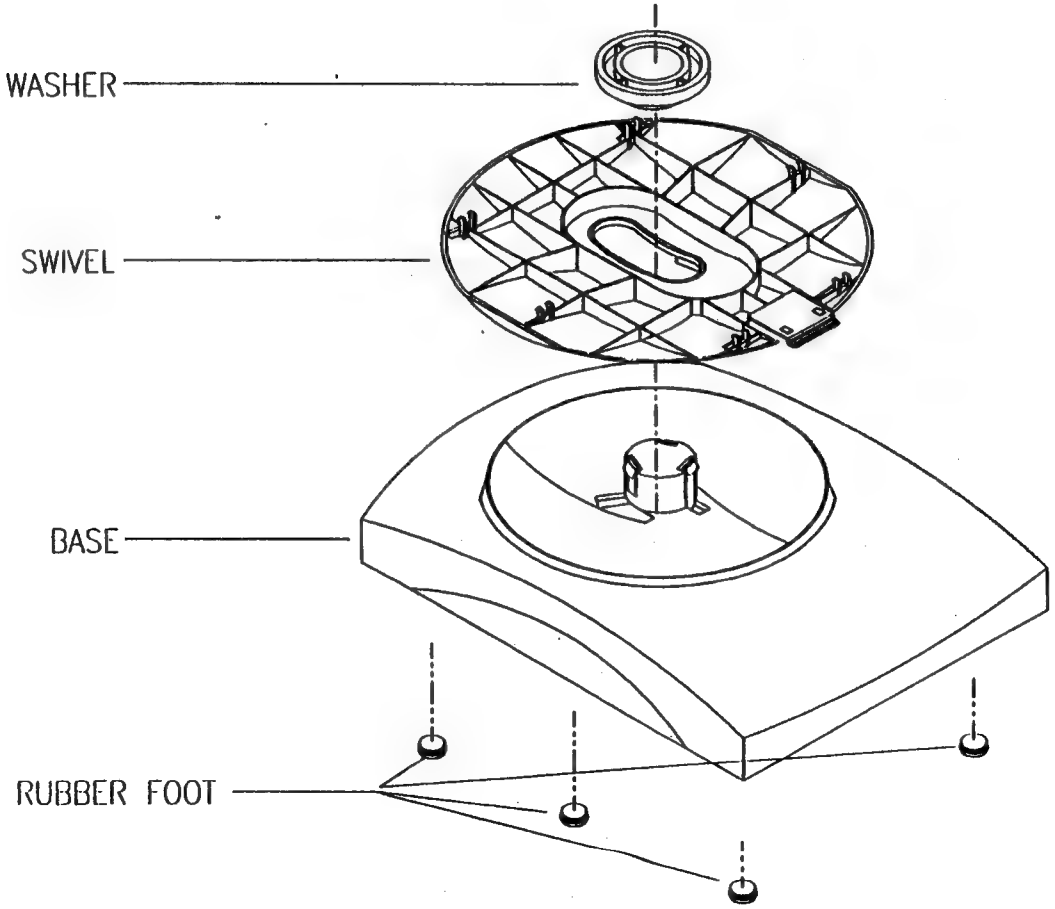
NOTE :
1. PUSH THE SWIVEL ON BASE AND SECURE IT WITH WASHER.



V95-2

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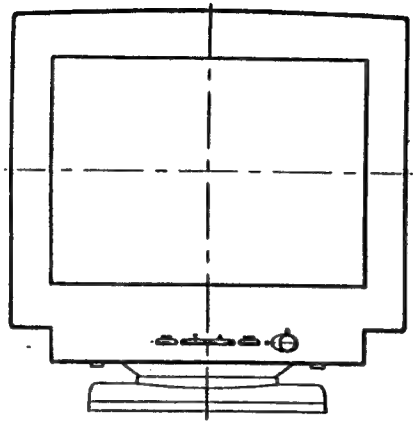

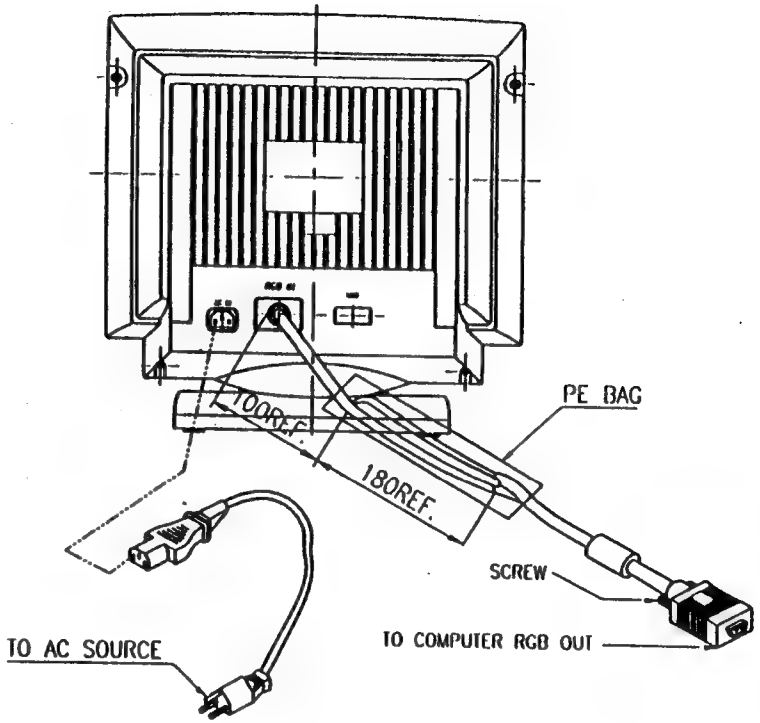

NOTE : UNLESS OTHERWISE SPECIFIED

1. POSITION THE REAR COVER MAKING SURE THE TABS ALONG THE FRONT EDGE ARE PROPERLY SNAPPED IN PLACE. PLACE THE FOUR SCREWS.
2. SNAP THE TILT AND SWIVEL BASE INTO POSITION.
3. BE SURE TO ADHERE "ID LABEL" ON THE BACK SIDE OF REAR COVER.
4. MAKE SURE THE MOTION BETWEEN TILT AND SWIVEL IS SMOOTH, WITHOUT SQUEAKS AND GAPS. APPLY LUBRICANT ONTO FRICTION SURFACE OF SWIVEL DEVICES IS ACCEPTABLE.
5. SET THE MONITOR ON ITS BASE AND MAKE SURE THAT THE CRT FACEPLATE WAS NOT SCRATCHED OR OTHERWISE DAMAGED.
6. PACKING MATERIAL HAVE TO MEET WITH ENG'R SPEC.
7. APPEARANCE INSPECTION SHALL MEET WITH APPEARANCE INSPECTION CRITERION OF NO 10000-0151

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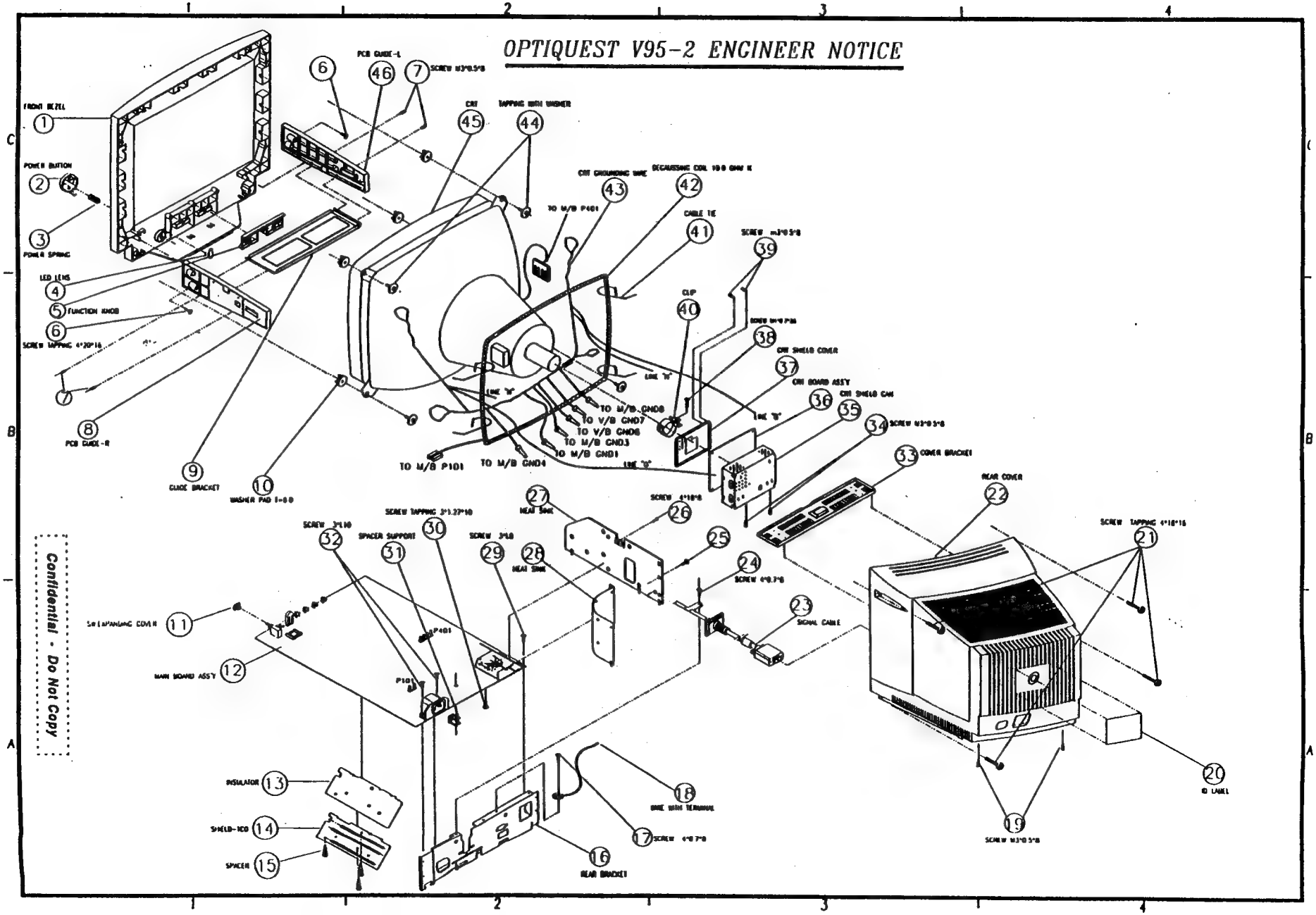


OPTIQUEST V95-2 ENGINEER NOTICE

NOTE :
UNLESS OTHERWISE SPECIFIED

A."FRONT BEZEL" & "CRT ASS'Y"
(NOTICE : WITH THE CRT FACING DOWNWARD ON A PROTECTIVE PAD, USE THE STEPS THAT FOLLOW TO ASSEMBLE THE "FRONT BEZEL & CRT".)

1. ASSEMBLING THE "POWER BUTTON ATTACH SPRING" INTO FRONT BEZEL.
2. PLACING FUNCTION KEY BEHIND THE PILLAR ON THE FRONT BEZEL SECURE IT WITH "HOT MELT GLUE".
3. PLACING LED LENSE ON THE FRONT BEZEL SECURE IT WITH "HOT MELT GLUE".
4. LOOP THE CRT GROUND WIRE AROUND THE BACK OF THE CRT AND UNDER THE FOUR CORNER METAL TABS(OR CRT MOUNTING LUG). POSITION LAST THE CORNER WITH THE SPRING.
5. PLACING THE DEGAUSSING COIL AROUND THE BACK OF THE CRT AND HARNESS OF COIL HOUSING IS IN PROPERLY DIRECTION TO EASY CONNECT TO MAIN BOARD CONNECTOR, P101. MAKE SURE NOT TO DAMAGE THE CRT GROUND WIRE AND NOT TOO CLOSE TO CRT CAP (H.V CAP)
6. AFTER THAT WRAP THE DEGAUSSING COIL WITH THE PLASTIC CABLE TIES TO HOLD THE DEGAUSSING COIL IN PLACE AND UNDER THE FOUR CORNER CRT MOUNTING LUG.
7. WITH THE FRONT BEZEL LYING FACE DOWN ON A PROTECTIVE PAD, PLACE FOUR WASHER PAD ON BOSS OF FRONT BEZEL CORNER. POSITION THE CRT SO THAT THE CORNER METAL TABS FIT PROPERLY IN THE FRONT BEZEL.
8. SECURE THE CRT GROUND WIRE AND CRT AT EACH OF THE FOUR CORNERS WITH THE "SCREW WITH LOCK WASHER". BE SURE SECURE IT IN PROCEDURE WITH DIAGONAL STEP.

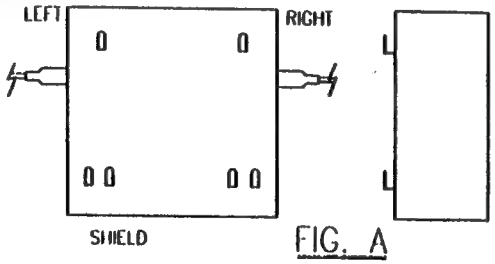


FIG. A

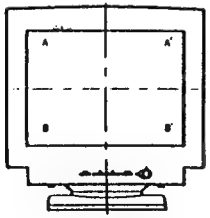


FIG. B

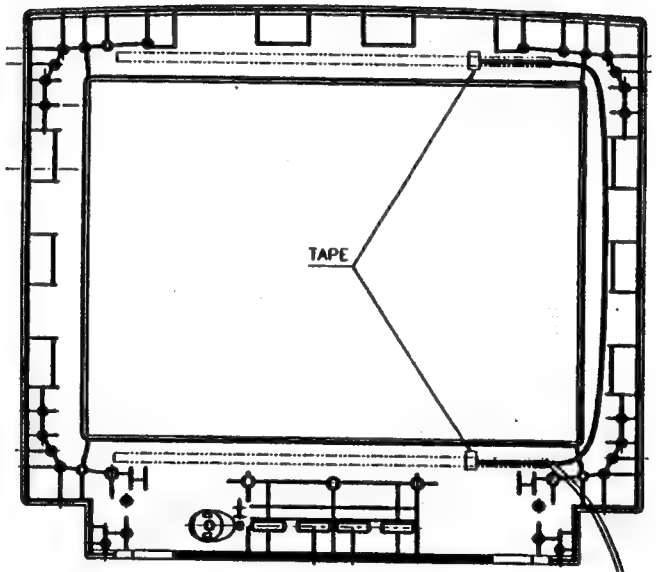
CORNER A , A' : 0.8mm (MAX)
EDGE AA' : 0.8mm (MAX)
CORNER B , B' : 0.8mm (MAX)
EDGE AB,A'B',BB' : 0.8mm (MAX)

B. "FRONT BEZEL ASS'Y", "VIDEO BOARD" & "MAIN BOARD ASS'Y" :

1. STAND THE MONITOR ON ITS FRONT WITH THE SCREEN FACING DOWNWARD.
2. PLACE ROTATION COIL HARNESS AT THE P701 CONNECTOR ON THE MAIN BOARD ASS'Y.
3. PUSH THE MAIN BOARD ASS'Y UNTIL YOU HEAR A CLICK AS THE SNAPS HOOK.
4. PLACE DEGAUSSING COIL RED AND BLACK HARNESS AT THE P101 AND GND2 CONNECTOR ON THE MAIN BOARD, RESPECTIVELY.
5. INSERT THE FOCUS(RED/WHITE COLOR) WIRE AND CONNECT THE SCREEN(GREY COLOR) WIRE ON THE CRT SOCKET OF THE VIDEO BOARD.
6. CONNECT THE CRT GROUNDING WIRE*2(BLACK COLOR) AT CRT LOWER RIGHT SIDE. BETWEEN THE VIDEO BOARD;GND6&GND7 AND THE CRT GROUND.
7. CONNECT THE CRT SOCKET AND CRT PINS THEN APPLY SILICON BOND AT THE PLUG/SOCKET JUCTION.
8. CONNECT THE CRT SOCKET AND CRT PINS THEN SECURE THE VIDEO BOARD WITH NECK RING SEREW OF CRT.
9. CONNECT THE CRT GROUNDING WIRE WITH TAB BETWEEN THE VIDEO BOARD SHIELD CAN AND THE CRT GROUND. REFER TO FIG. A.
10. SOLDER THE CRT GROUNDING WIRE(W/O TAB) BETWEEN THE VIDEO BOARD SHIELD COVER AND THE CRT GROUND. REFER TO FIG. A.
11. CONNECT THE CRT GROUNDING WIRE*2(WHITE COLOR) AT CRT LOWER RIGHT SIDE BETWEEN THE MAIN BOARD; GND1& GND3 AND THE CRT GROUND.
12. CONNECT THE CRT GROUNDING WIRE*1(WHITE COLOR) AT CRT LOWER RIGHT SIDE BETWEEN THE MAIN BOARD; GND8 AND THE CRT GROUND.
13. CONNECT THE CRT GROUNDING WIRE*1(BLACK COLOR) AT CRT LOWER LEFT SIDE BETWEEN THE MAIN BOARD; GND4 AND THE CRT GROUND.
14. CONNECT THE 8PINS HARNESS BETWEEN THE MAIN BOARD; P802 AND THE VIDEO BOARD CONNECTOR; P602.
15. CONNECT THE 8PINS HARNESS BETWEEN THE MAIN BOARD; P402 AND THE VIDEO BOARD CONNECTOR; P603.
16. PLACE THE DY CONNECTOR AT THE P401 CONNECTOR ON THE MAIN BOARD. TO TIES A KNOT BEFORE PLACING THE DY CONNECTOR AND MAKE SURE THE POSITION OF KNOT LOWER THAN HEAT SINK-FBT HEIGHT.
17. CONNECT SIGNAL CABLE 13PINS HARNESS TO VIDEO BOARD CONNECTOR; P601.
18. PUSH THE SIGNAL CABLE INTO REAR BRACKET WITH ITS S/R HOOK UPWARD AND SECURE IT AT REAR BRACKET TAB WITH THE SCREW. THE SCREW SPEC. IS M4*0.7*8
19. SECURE THE GUIDE BRACKET AND PCB GUIDE-L/R WITH THE SCREWS. SCREW SPEC. IS M3*0.5*8
20. MAKE SURE ONE "GUIDE BRACKET" TO BE ALREADY ASSEMBLED ON THE BACK SIDE OF THE MAIN BOARD IN FINAL ASSEMBLY. THIS "GUIDE BRACKET" IS USED TO SECURE THE MAIN BOARD ON THE REAR COVER
21. THE GAPS BETWEEN THE CRT SCREEN(OR GLASS) AND THE BEZEL PLASTIC SHALL NOT BE GREATER THAN THE FOLLOWING SPEC. AS SHOWN IN FIG. B.

OPTIQUEST V95-2 ENGINEER NOTICE

TCO FOR SAMSUNG CRT ONLY



OPTIQUEST V95-2 ENGINEER NOTICE

NOTE : UNLESS OTHERWISE SPECIFIED

1. PUSH THE SIGNAL CABLE INTO REAR BRACKET WITH ITS S/R HOOK UPWARD AND SECURE IT AT REAR BRACKET TAB WITH THE SCREW.
2. PART NUMBER & VERSION OF IDENTIFICATION LABEL IS ADHERED ON THE REAR BRACKET AS FIG. 1 SHOWN.

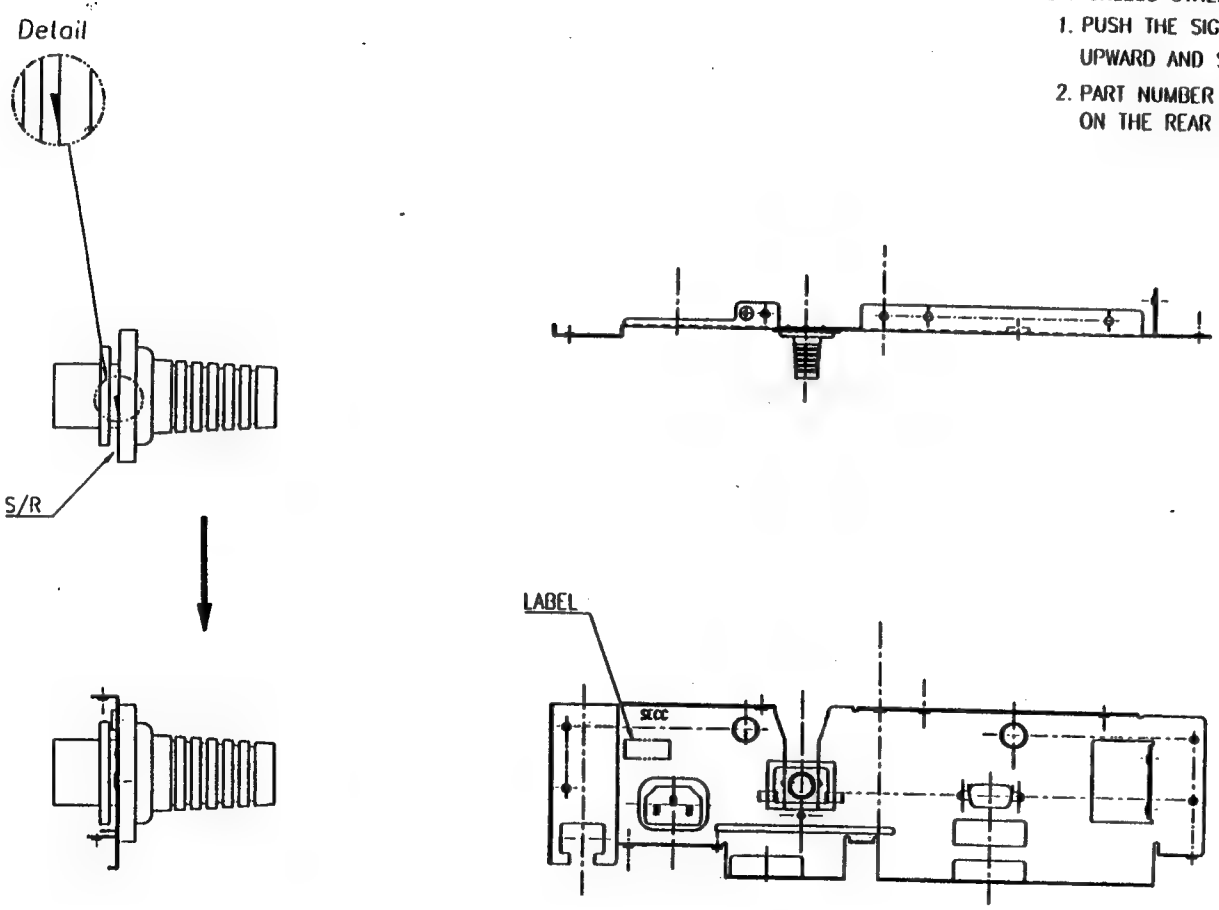


FIG. 1

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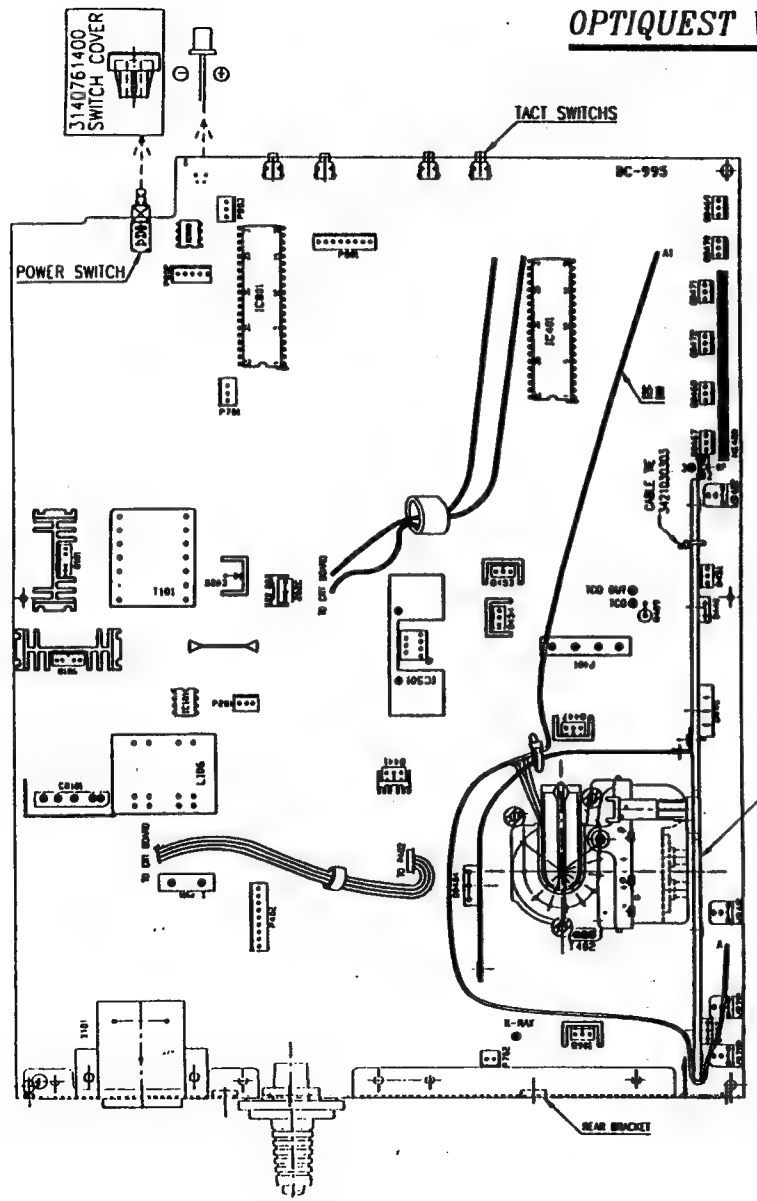
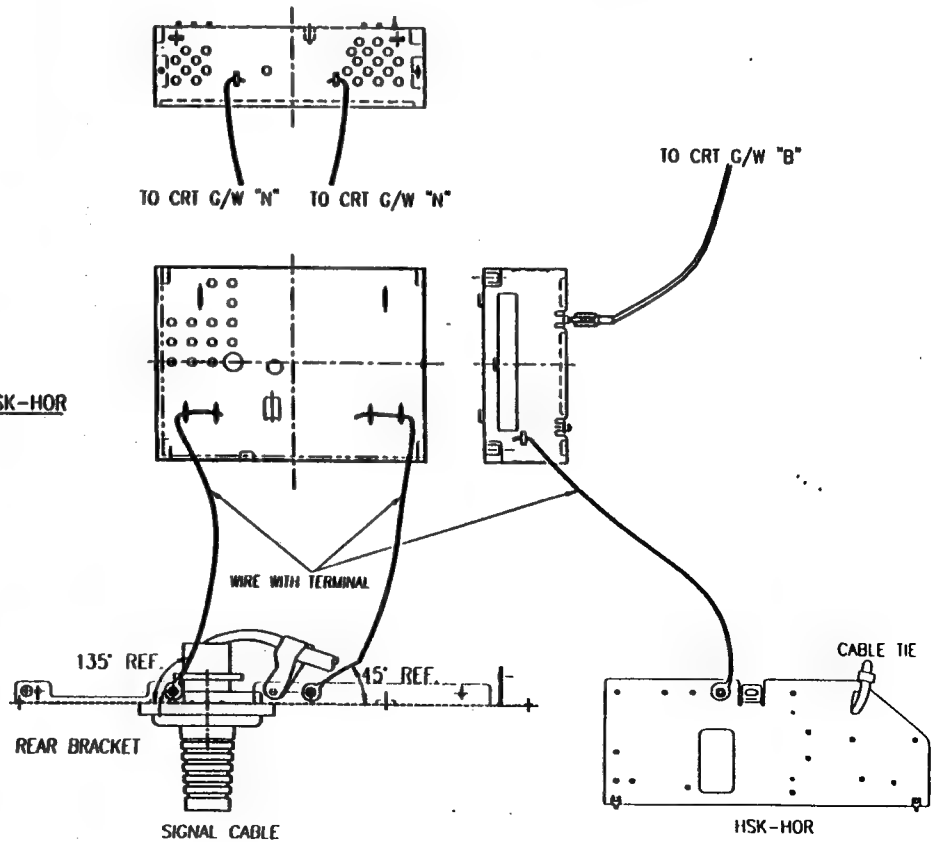


NOTE : UNLESS OTHERWISE SPECIFIED

1. PLACE EMIFILTER; X101 ON THE MAIN BOARD. BE SURE X101 IN POSITION.
2. SECURE THE EMI FILTER AND REAR BRACKET WITH SCREWS.
3. INSERT LED HOUSING AFTER FORMATING ON THE MAIN BOARD.
4. BE SURE LED HOUSING IN POSITION.
5. BE SURE RING TONGUE IN POSITION.
6. GLUE THE SWITCH AND COVER WITH "SW101 BEFORE PLACING THE SWITCH COVER IN "SW101" PLACE.



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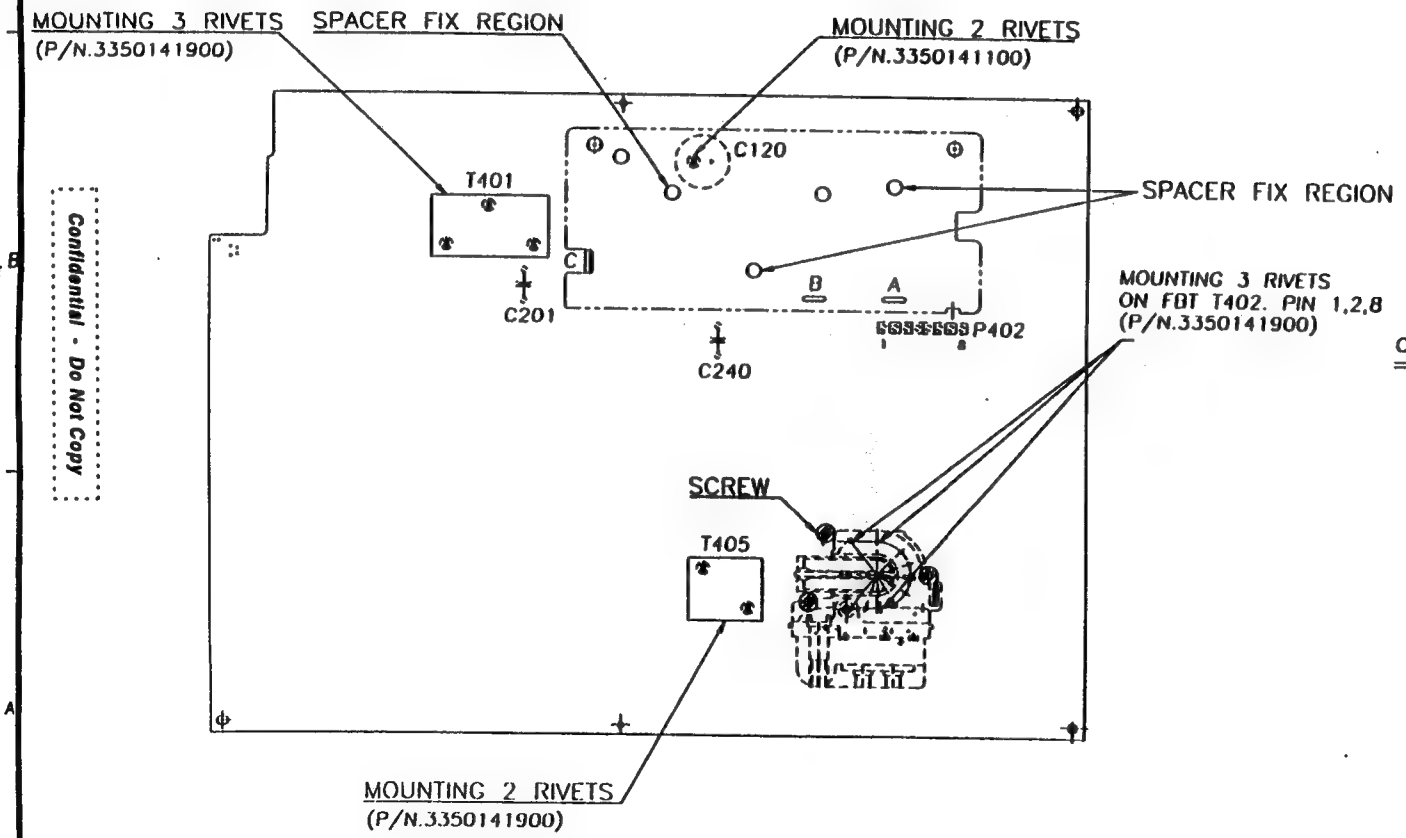
NOTE :

1. PRESS 3 SPACER INTO THE MAIN BOARD THROUTH SHIELD-TCO TO FIX REGION AS SHOWN BELOW.
2. SOLDER THE THREE TABS ON THE UNDERSIDE OF THE SHIELD-TCO AT A,B,C POINT OF THE MAIN BOARD.

SOLDER SIDE



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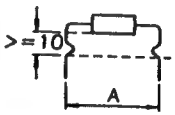
COMPONENTS FORMAT & KINK DRAWING

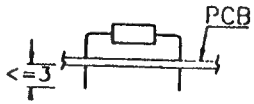
A=20 R138, R139, R607, R0419



A=17.5 R510, R511, R512

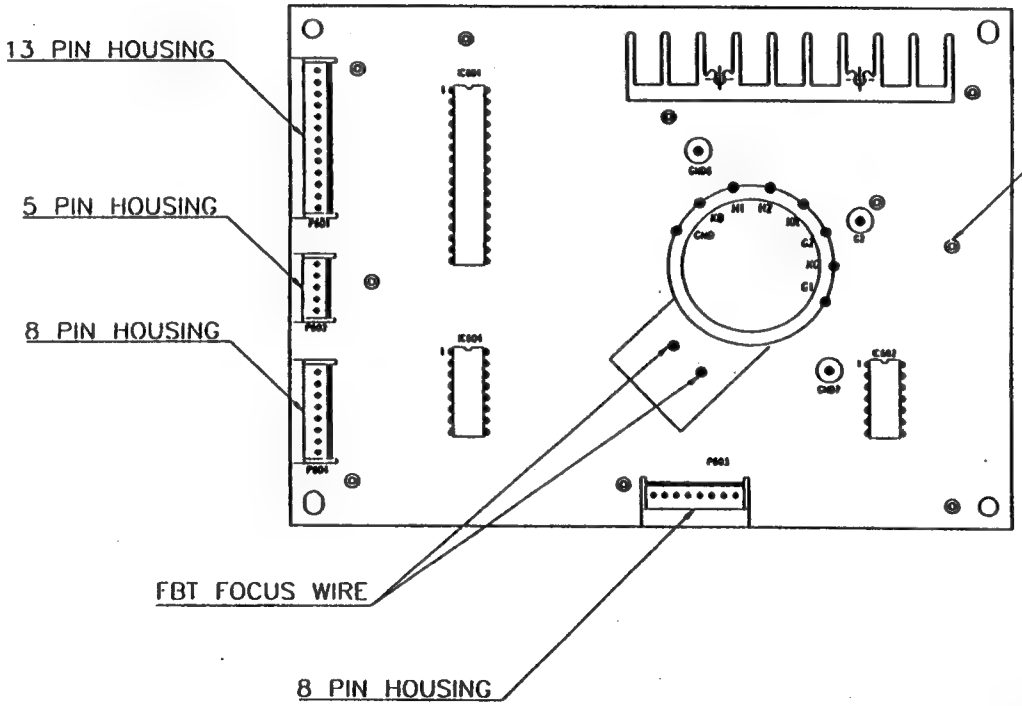
A=15 R464

T402
L411



V95-2

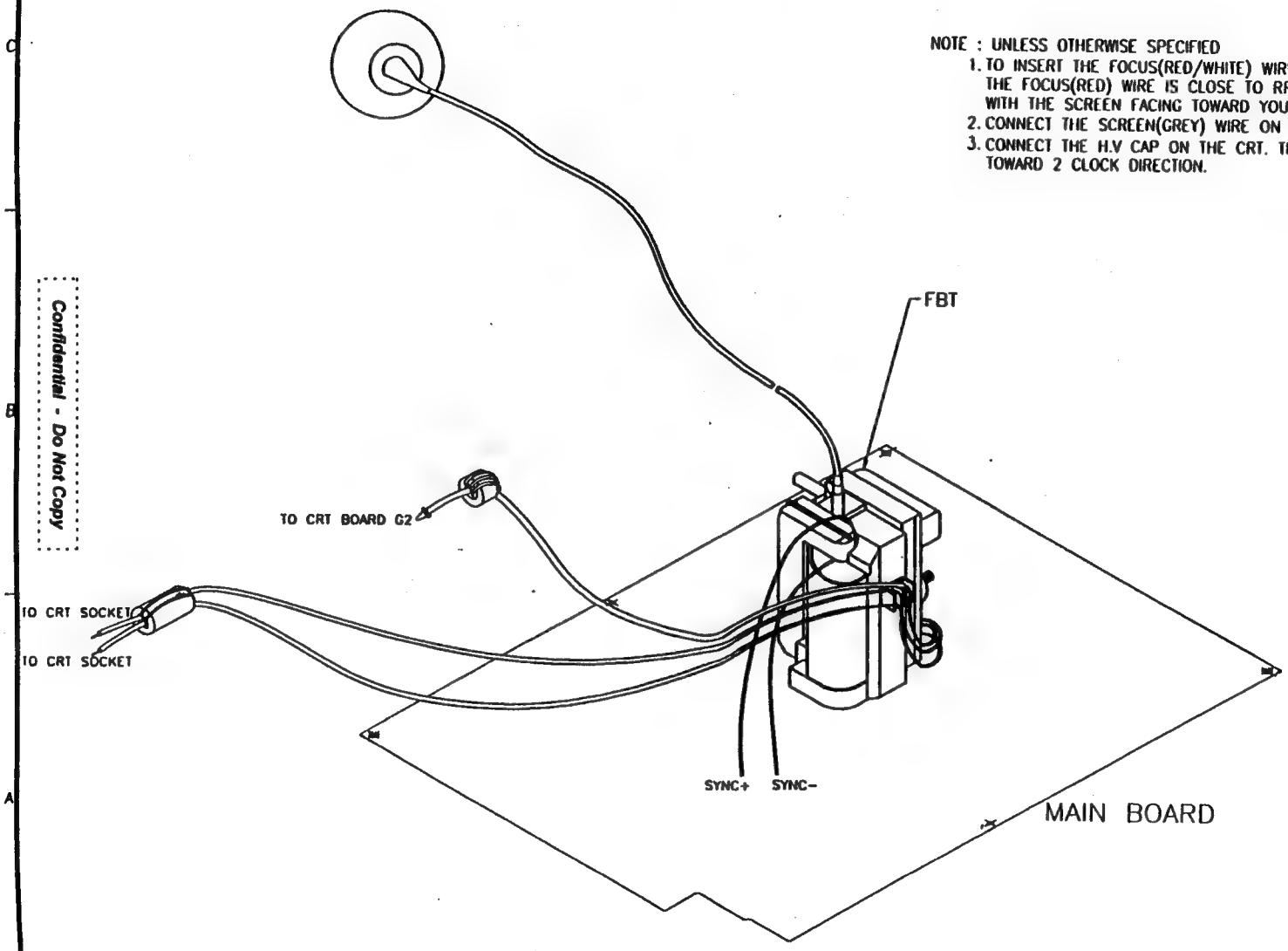
OPTIQUEST V95-2 ENGINEER NOTICE



NOTE : UNLESS OTHERWISE SPECIFIED
1. MAKE SURE HOUSING AND CRT SOCKET ARE IN POSITION.
2. INSERT GND6,GND7, AND G2 REGION WITH ROUND PIN.
3. INSERT GND,KB,H2,G2 OF CRT SOCKET PIN WITH ROUND PIN.
4. INSERT RIVET PIN AT DOUBLE SIDE FOIL HOLD.

OPTIQUEST V95-2 ENGINEER NOTICE

NOTE : UNLESS OTHERWISE SPECIFIED
1. TO INSERT THE FOCUS(RED/WHITE) WIRE INTO THE CRT SOCKET. THE FOCUS(RED) WIRE IS CLOSE TO RRIGHT SIDE OF CRT SOCKET WITH THE SCREEN FACING TOWARD YOU.
2. CONNECT THE SCREEN(GREY) WIRE ON THE CRT SOCKET OF THE VIDEO BOARD.
3. CONNECT THE H.V CAP ON THE CRT. THE LEAD WIRE TOWARD 2 CLOCK DIRECTION.



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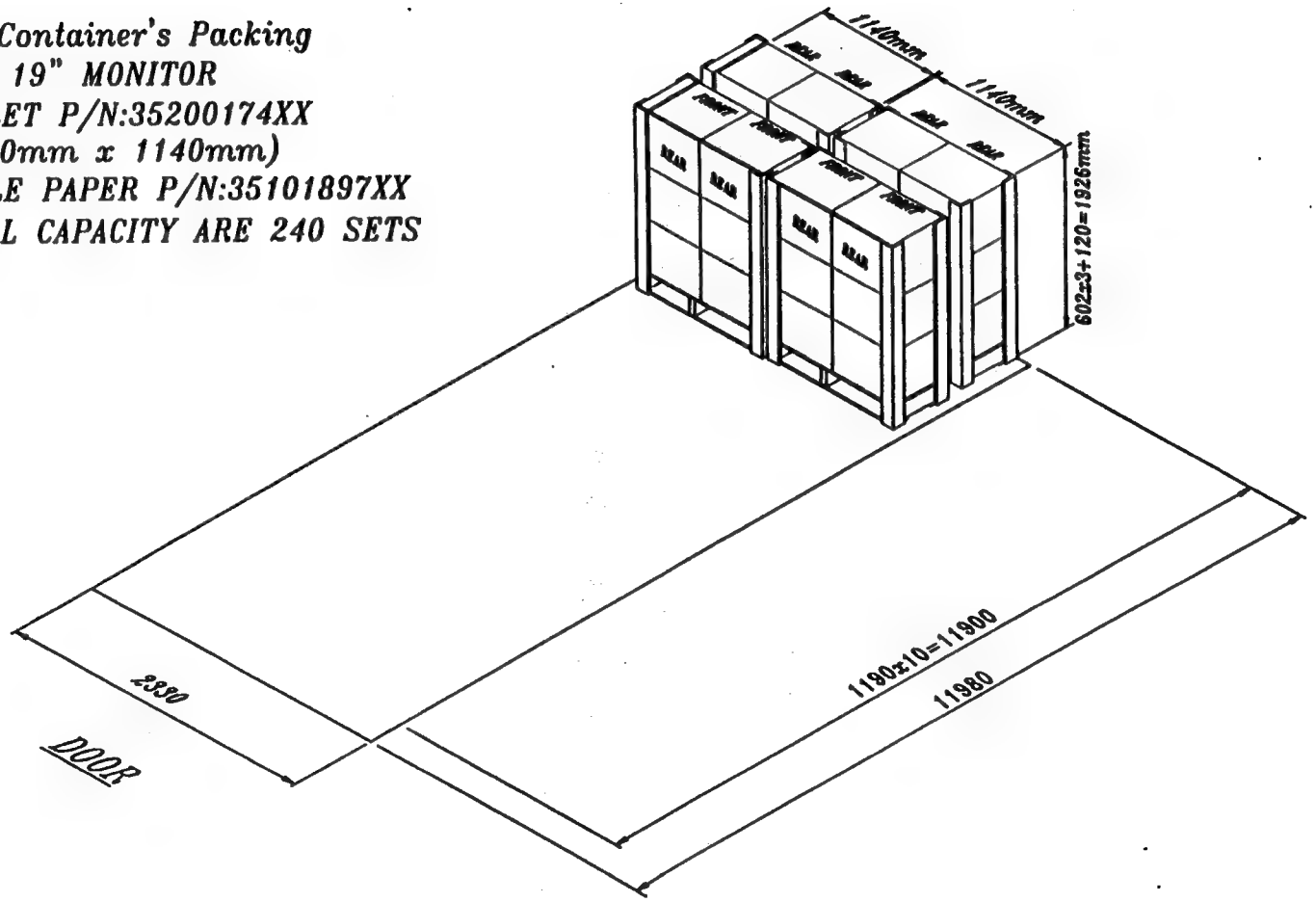
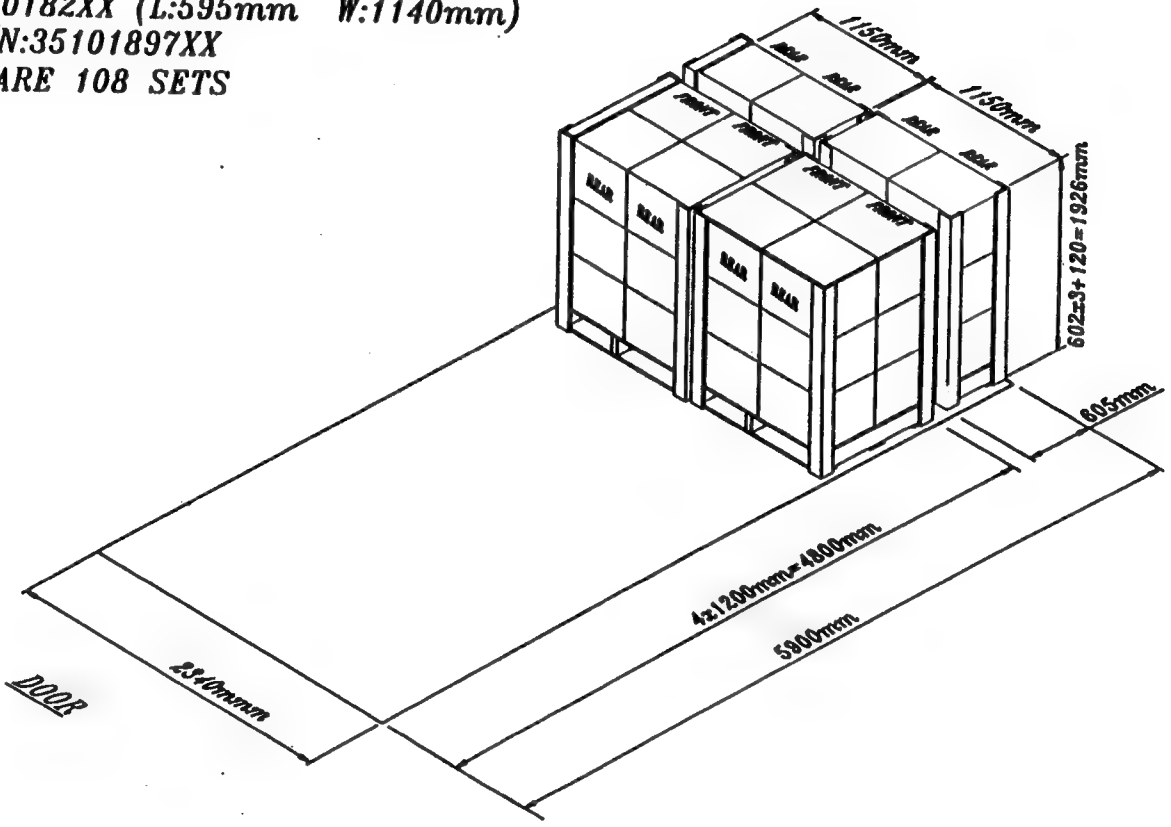
40' Container's Packing
FOR 19" MONITOR
PALLET P/N:35200174XX
(1190mm x 1140mm)
ANGLE PAPER P/N:35101897XX
TOTAL CAPACITY ARE 240 SETS



V95-2

OPTIQUEST V95-2 ENGINEER NOTICE

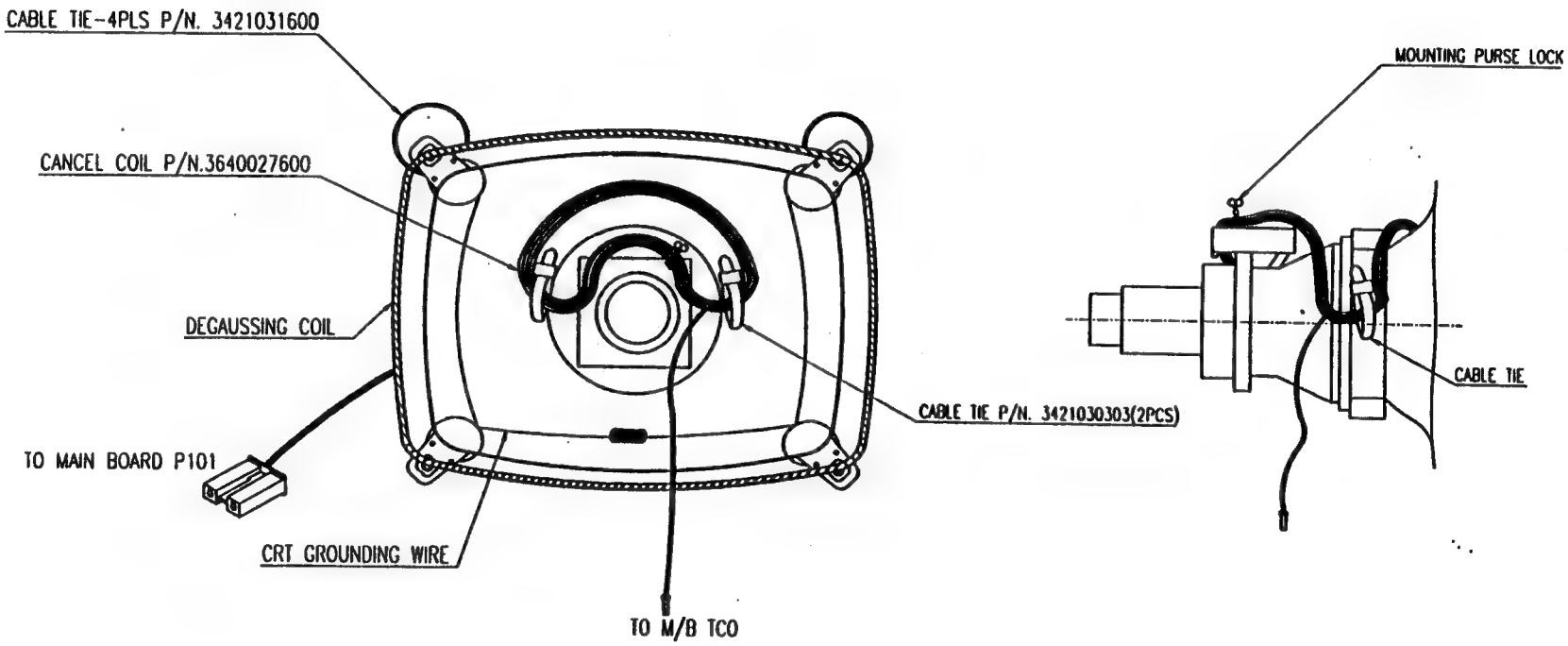
20' CONTAINER'S PACKING
FOR 19" MONITOR
PALLET P/N:35200174XX (L:1190mm W:1140mm)
PALLET P/N:35200182XX (L:595mm W:1140mm)
ANGLE PAPER P/N:35101897XX
TOTAL CAPACITY ARE 108 SETS



Optiquest Inc.

OPTIQUEST V95-2 ENGINEER NOTICE

SAMSUNG CRT ONLY

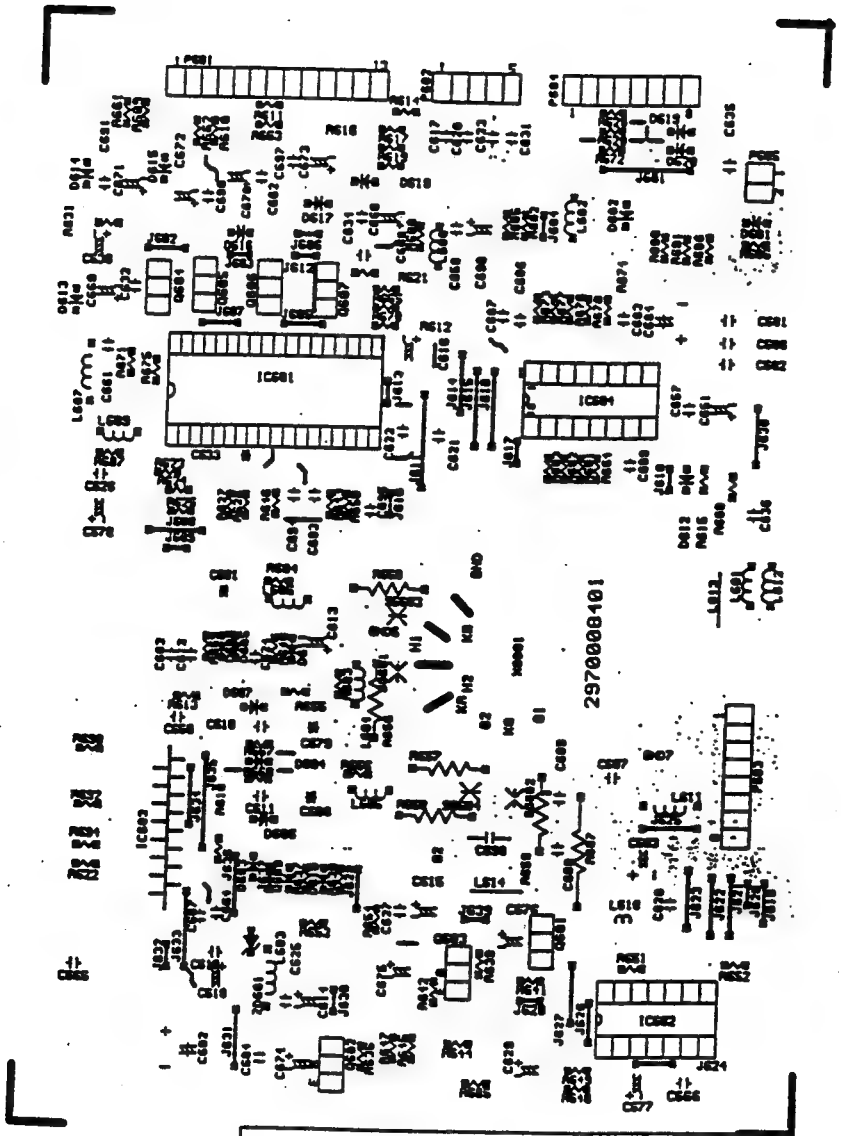


Confidential - Do Not Copy

V95-2

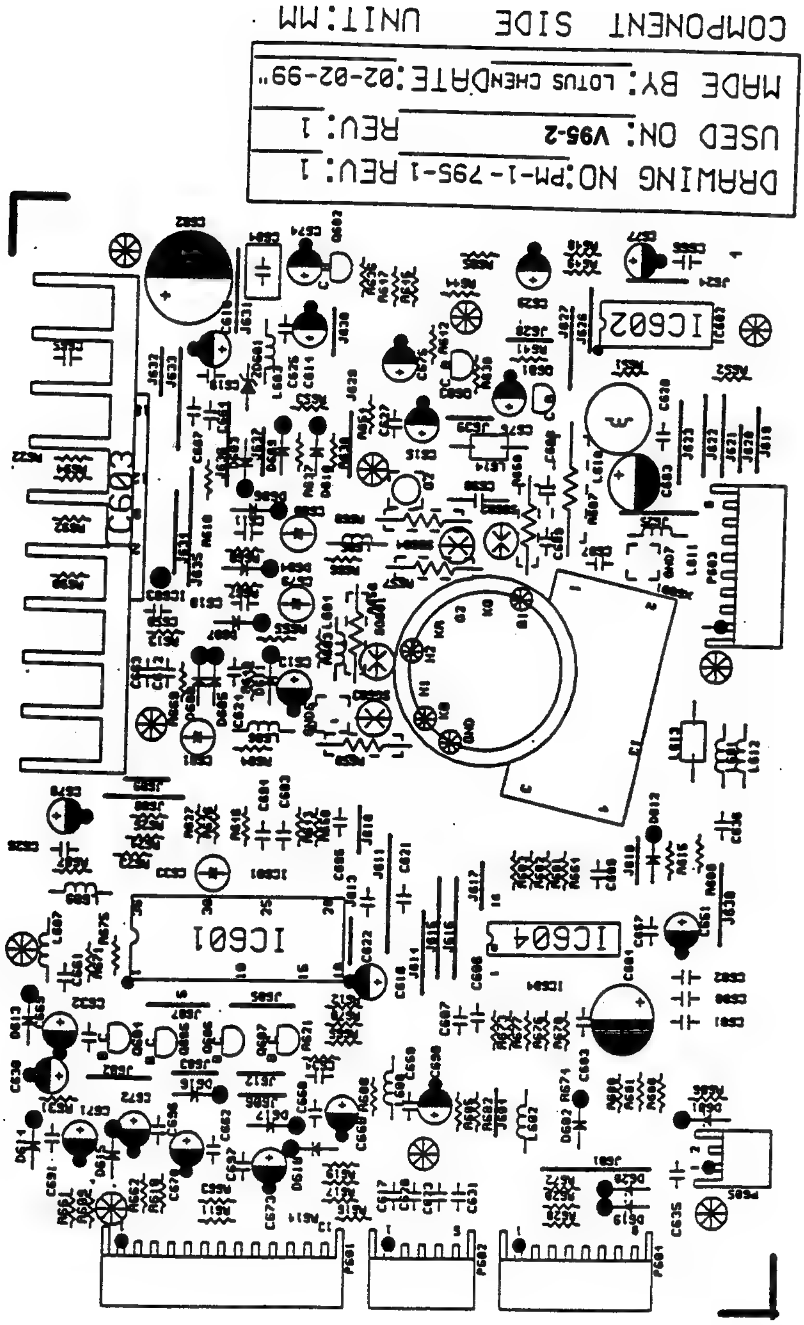
OPTIQUEST V95-2 SCREW TORQUE LIST

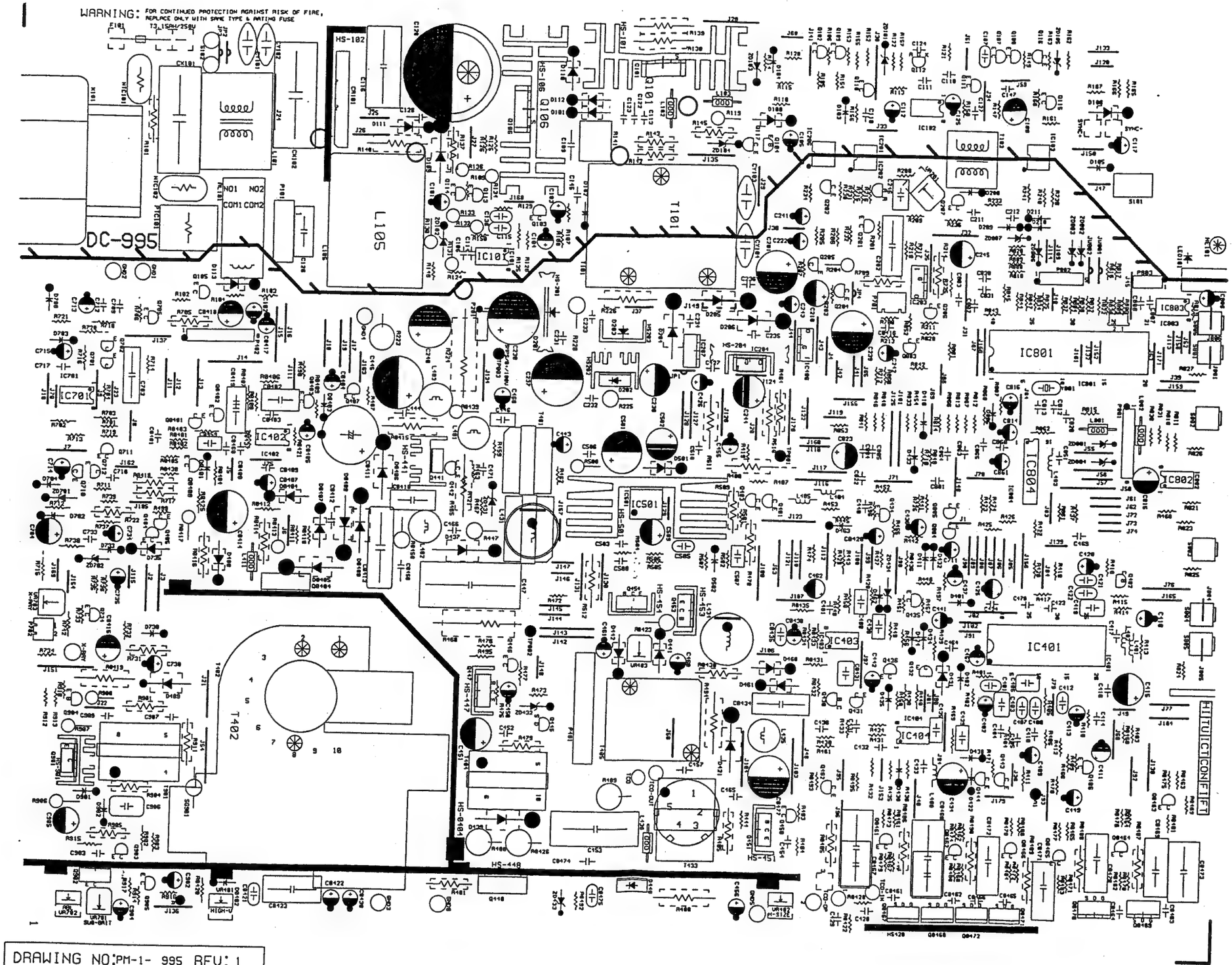
ASSEMBLY PARTS	SCREW DESCRIPTION	SCREW PART NO.	TORQUE (Kgf.CM)	REMARK
BEZEL + CRT	TAPPING SCREW Ø5*16*27	31090302XX	22~24	
BEZEL+COVER	TAPPING SCREW Ø 4*18*16	31090202XX	8~12	
BEZEL+GUIDE	TAPPING SCREW Ø 4*20*16	31090210XX	8~12	
FBT + HSK-HOR	TAPPING SCREW Ø 4*18*8	31090204XX	4~6	
HSK-FBT+HSK-HOR REAR BKT+HSK-HOR MB+REAR BKT	TAPPING SCREW Ø 3*0.5*8	31090101XX	10~15	
Q447/451/453/454/901/902 Q0471/0472/0467/0468 Q440/IC501 GUIDE BKT/ COVER BKT SHIELD CAN+SHIELD COVER/ SHIELD COVER + IC603 HSK	MACHINE SCREW M3*0.5*8	31003008XX	3~5	
IC603 VIDEO BOARD Q101/106/0404/441 CR101	MACHINE SCREW M3*0.5*10	31003010XX	3~5	
FILTER+MB+BKT	TAPPING SCREW Ø3*0.5*10	31090103XX	10~15	
SIGNAL CABLE+BKT - WIRE WITH TERMINAL + REAR BKT	TAPPING SCREW M4*0.7*8	31090207XX	14~15	
WIRE WITH TERMINAL + HSK-HOR	TAPPING SCREW M4*0.7*8	31090207XX	8~10	
Q448 + HSK-HOR	MACHINE SCREW M3*0.5*12	31003012XX	3~5	
CRT CLIP + SHIELD COVER	MACHINE SCREW M4*0.7*28	31026226XX	3~5	



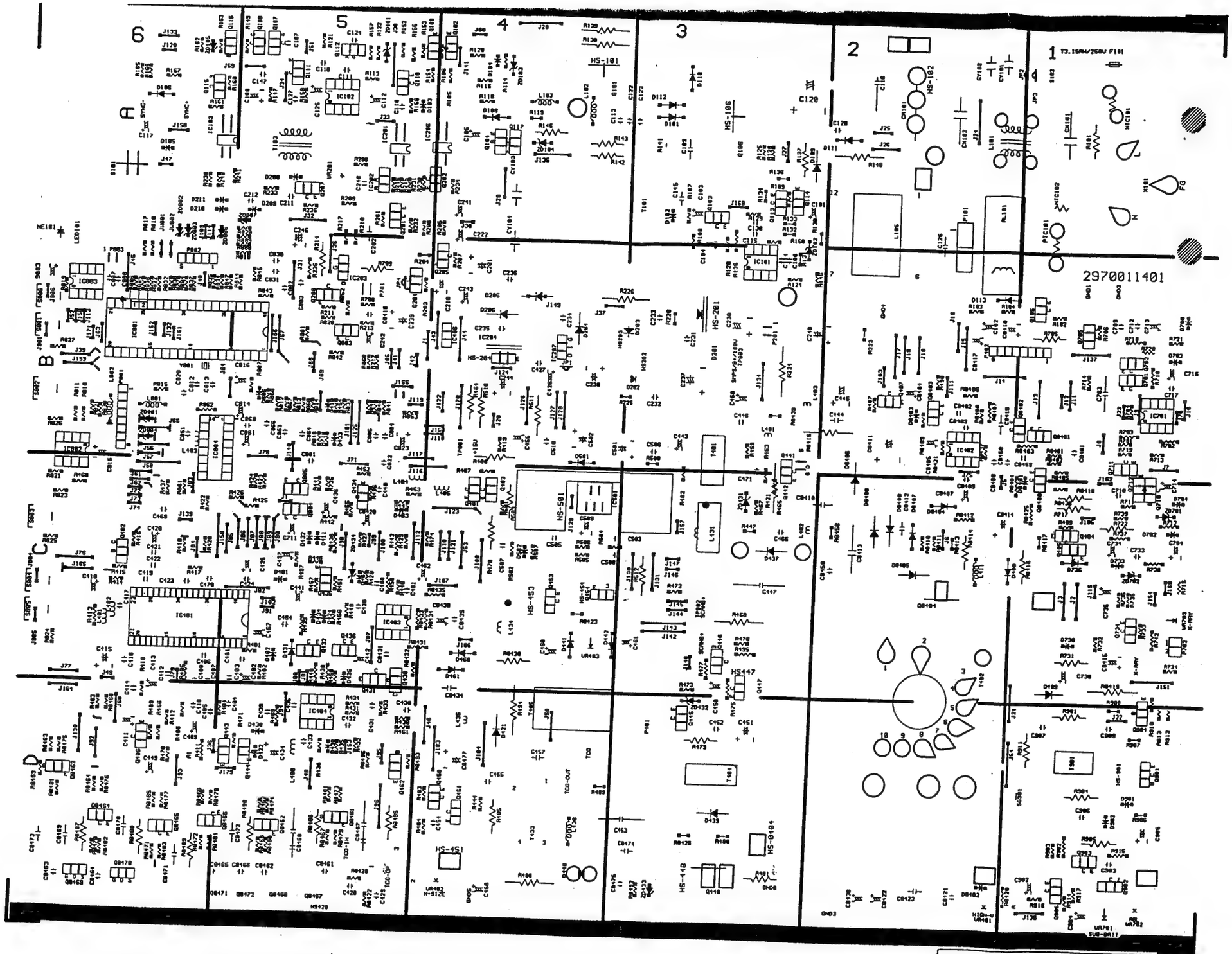
DRAWING NO:	PM- 795-1	REV:	1
USED ON:	V95-2	REV:	1
MADE BY:	LOTUS CHEN	DATE:	02-02-99"

SOLDER SIDE UNIT: MM


COMPONENT SIDE UNIT:MM
MADE BY: LOTUS CHEN DATE: 02-02-99
USED ON: V95-2 REV: 1
DRAWING NO: PM-1-795-1 REV: 1



DRAWING NO: PM-1- 995 REV: 1
USED ON: **V95-2** REV: 1
MADE BY: LOTUS CHEN DATE: 02/08/99"
COMPONENT SIDE UNIT: MM



DRAWING NO: PM- 995 REV: 1
USED ON: V95-2 REV: 1
MADE BY: LOTUS CHEN DATE: 02/08/99"
SOLDER SIDE UNIT: MM

V95-2 RECOMMEND SPAREPARTS LIST

	PART NO	REF.	DES.	DESC
	0741900410	M46QCE261X112		CRT .26 19 NO-glare AS
	2840001703	HJC-97494		DEGAUSSING COIL 21.98OHM K STD
	3072000900			POWER CODE 3PIN DA-1565MB
	3360201400			REAR COVER PC+ABS 94 5V #Y0-48
	3360600300			POWER BUTTON (PC+ABS) DC-995 S
	3360700000			FUNCTION KEY (PC+ABS) DC-995 S
	3361001900			FRONT BEZEL (PC+ABS) DC-995 SA
	3368036700			SWIVEL BASE ASSY ABS 94HB #YO-
	0133128002	RSI-1 128JTB	R508	RES MOF 1W 1.2 J
	0133201002	RSI-1201JTB	R408	RES MOF 1W 200 J
	0133339002	RSI-1R33JTB	R138	RES MOF 1W 0.33 J
	0143100002	RSI-2200JTB	R226	RES MOF 2W 10 J
	0143208002	RSI-22ROJTB	R494	RES MOF 2W 2 J
	0153680005	MOR-3W680J	R489	RES MOF 3W 68 J
	0153759722		R480	RES MOF 3W .75 J SMALL
	0190300506	RF1ST52A1ROJ	R0415	RES FUSING MF 1W 1 J
	0190400706	RF2ST52A100HMJ	R0417	RES FUSING MF 2W 10 J
	0223473305	PRM-5W47KJ	R141	RES Q 5W 47K J P=7.5mm
⚠	0720060607		RL101	RELAY 240VAC/12VDC 5A DPST
	0730240212		Y801	CRYSTAL 8MHZ 30PPM 30PF
⚠	0805340601	5HTP3.15	F101	FUSE TSC 3.15A UL SEM PIG
⚠	0900080024		PTC101	PTC R=14 OHM 25A
⚠	0910500511	N13SP005	NTC101	NTC R=5 OHM L 5A
	0921020118		SG901	SPARK GAP 1KVDC M TP
⚠	1101046027	DE1007E222M-KH	CY101	CAP Y CD 250VAC 2.2KP M E I
	1101349027	DE1610E472M-KX	CY103	CAP Y CD 250VAC 4.7KP M E II
	1142354403	EMB103MX3	C109	CAP CD 1KV .01U M Z5U KI10
	1152940301	D331K29Y5PP6BK7	C0474	CAP CD 2KV 330P K Y5P KI7.5
⚠	1410233003	LLQ2G331MHSB	C120	CAP AL 400V 330U M 30*40
	1410609207	SME25VB1000M12.5*2	C201	CAP AL 25V 1KU M 12.5*20
	1410630905	UVX2E470ML	C445	CAP AL 250V 47U M 16*25
	1410631305	UVX2E220ML	C0414	CAP AL 250V 22U M 12.5*25
	1412009605	UVX1E471MT	C0477	CAP AL 25V 470U M 10*16 TP
	1430821305	UVT2A101ML	C240	CAP AL 100V 100U M 13*20
	1430830007	KME250VB100M18*35.	C0411	CAP AL 250V 100U M 18*35.5
	1432306105	UVT1C102MT	C239	CAP AL 16V 1KU M 10*20 TP
⚠	1604315020	PA474-L	CX101	CAP X MM PC 275VAC .47U M
	1653113001	41-5-224-15-K	C0434	CAP MM DP 250V .22U J KI15
	1753110215	DHSM(204)250VDC473	C0469	CAP MP DP 250V .047U J KI10
	1753112215		C0470	CAP MP DP 250V .1U J KI10
	1753115215	DHSM250VDC474J(204	C0468	CAP MP DP 250V .47U J KI10
	1753116215	DHSM250VDC684J(204	C0467	CAP MP DP 250V .68U J KI10
	1753139106	7U2E335J-CG(PMS)	C447	CAP MP DP 250V 3.3U J KI20
	1753155215	DHSM(204)250VDC184	C0471	CAP MP DP 250V .18U J KI10
	1753173215	DHSM(204)250VDC304	C0472	CAP MP DP 250V .3U J KI10
	1763113206	7B2G224J-CC(PMV)	C0473	CAP MP DP 400V .22U J KI10
⚠	2000111604	D3SB60	CR101	DIO BRD 4A 600V
	2010121201	RGP20D TAPING	D421	DIO FRD 2A 200V D201
	2010281801	BYV26D	D0408	DIO FRD 1A 800V
	2010321807	UF5407	D202	DIO FRD 3A 800V DO-201

V95-2 RECOMMEND SPAREPARTS LIST

	PART NO	REF.	DES.	DESC
	2010391601	BYM26C	D437	DIO FRD 2.3A 600V
	2011112115	5TUZ47C	D440	DIO FRD 5A 1500V T220
	2011372009	BYM36E	D0405	DIO FRD 2.9A 1000V SOD-64
	2011551218	31DF2	D204	DIO FRD 1.6A 200V 30nS
	2011561609	BYV28-600	D0406	DIO FRD 3A 600V SOD-64
	2020770618	31DQ06	D439	DIO SBD 3A 60V D41
	2050252044	RG4C LFL1	D203	DIO SI 2A 1000V 100nS D0201AD
	2120137009	2SD669AWC	Q451	TR 160V 1.5A hfe=100-200 TO126
	2120150006	2SC5411(HFE)	Q448	TR 600V 18A T3P HFE:4.5-6.5
	2130022009	2SB649AC	Q454	TR -160V -1.5A 100-200 TO126
	2300040531	L-934SGD	LED101	LED GRN 3MM 2PIN
	2306000354		NE101	NEON LAMPS ORG 4mm 2P
⚠	2310002001	H11AV1AV	IC103	PHOTO 70V 6PIN 100-300% VDE
⚠	2430028001	IRFPE50	Q101	FET 800V 8A T3P
	2430044006	YTAF630	Q0467	FET 200V 10A T220
	2430044215	IRFS630A	Q0469	FET 200V 9A T220F
	2430061308	STW5NB90	Q0404	FET 900V 5.6A TO-247
	2430135233	FS10KM-12	Q441	FET 600V 10A T220 F
	2430148108	STP9NB60	Q441	FET 600V 9A T220
	2500007004	LM7812CT	IC406	IC REGU 12V 1A T220 3PIN
	2500007005	L7812CV	IC406	IC REGU 12V 1.5A T220 3PIN
	2500091026	TLE 4274V50	IC203	IC REGU 5V .25A P-T022-3-1
	2510003014	NE555P	IC404	IC TIMER 8PIN
	2510004210	UC3842BN	IC102	IC PWM 8PIN
	2510005310	UC3843BN	IC402	IC PWM 8PIN
	2520091012	NE5532N	IC403	IC OP AMP 8PIN
	2530010006	TDA8172	IC501	IC TV VERT DEFLECTION 7PIN
	2530069006	TDA9106	IC401	IC DEFLECTION PROCESSOR 42PIN
	2600035000	74LS221	IC804	IC MONOSTABLE DUAL 16PIN
	2610185342	M24C08BN6	IC802	IC EEPROM 8K 8PIN
	2610244028	WT60P1-N400WT	IC801	IC MICRO PROCESSOR 40PIN
	2805251900	LF-U10.5-02	T103	LF L3-7mH
	2816314000	17A-8010	L481	CHOKE CD 10uH K
	2816322601		L431	CHOKE CD 2.5mH K
	2816322700	17A-8011	L434	CHOKE CD 4.5mH K
	2817306700	17A-8006	T405	X'FMR DT 1.3mH K
	2817306800		T404	X'FMR DT 3mH K
	2817306900	17A-8008	T401	X'FMR DT 5.5-7.15mH
	2817307001	D12059	T901	X'FMR DT 6mH L
	2817600801		T433	CHOKE LINEAR COIL
⚠	2850004910		T402	FLYBACK TRANSFORMER
	1100046000	DE7100F222MVA1-KC		CAP Y CD 400VAC 2200pF M Y5U
	3421199000		NE101	LED HOLDER H=3 D4.2 DC-995
	3421199100		LED101	LED HOUSING H=7 DC-995
	4613177A06		C453	CAP PP DP 1.8KVH 4.3KP J KI22.
	4633126106	4U6T152J-CE	C0413	CAP PP DP 1.5KVH 1.5KP J KI15
	2010271607	UF4005	D488	DIO FRD 1A 600V D41
	2010271801	UF4006	D489	DIO FRD 1A 800V D41
	2010281201	BYV26A	D108	DIO FRD 1A 200V SOD57
	2010282001	BYV26E	D101	DIO FRD 1A 1000V

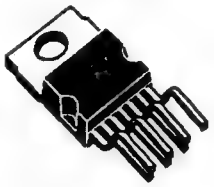
	PART NO	REF.	DES.	DESC
	2030120116	HZ12A2 TA	ZD432	DIO ZEN .5W 11.9-12.4V D35
	2030120316	HZ18-2 TA	ZD101	DIO ZEN .5W 17.5-18.3V D35
	2030120616	HZ36-3 TA	ZD104	DIO ZEN .5W 36.4-38.0V D35
	2030120816	HZ5C1 TA	ZD801	DIO ZEN .5W 4.9-5.1V D35
	2030122516	HZ6B1 TA	ZD434	DIO ZEN .5W 5.5~5.8V D35
	2030123216	HZ3C2 TA	ZD105	DIO ZEN .5W 3.2~3.4V D35
⚠	2030123616	HZ6A3 TA	ZD702	DIO ZEN .5W 5.4~5.7V D35
	2100063013	PH2369 TAPING	Q430	TR 40V 0.5A T92
	2100067006	BF422 TPE2	Q705	TR 250V 50mA TO-92 hfe=50min
	2100068138	KSC2328A-Y	Q702	TR 30V 2A T92L 160-320
	2100072007	MPSA44 M	Q104	TR 400V .3A TO-92
	2110039006	BF421	Q711	TR -300V -50mA T92
	2110041106	2SA1015-Y	Q108	TR 50V .15A T92 TP
	2110056138	KSA928A-Y	Q701	TR -30V -2A TO-92L
	2130007001	2SB857C	Q201	TR 50V 4A T220
	2200060001	BT169D	Q112	SCR 400V 0.8A T92
	2400013006	2SK941	Q445	FET 100V 0.6A T92
	2500004001	TL431CLP-RA	IC202	IC VOL ADJ T92 2% 3PIN
	2922050004	AL0307S-100J	L401	PEAKING COIL 10uH K TP AXIAL
	1142940803	BM6331KG1H	C688	CAP CD 1KV 330P K Y5P TP5
	1142963803	BM7821KG1H	C689	CAP CD 1KV 820P K Y5P TP
	0133128002	RSF1B0.43J	R607	RES MOF 1W 1.2 J
	0922010218		SG601	SPARK GAP 200VDC M TP
	1152349401	S472M47Z5UP65KO	C690	CAP CD 2KV 4.7KP M Z5U KI=10
	2520016010	LM324N	IC602	IC OP AMP 14PIN
	2530063107	M52743ASP	IC601	IC 3CH VIDEO PR-AMP 36PIN
	2530067034	MTV016N-11	IC604	IC OSD 16PIN
	2530072046	VP503	IC603	IC VIDEO OP AMP 18PIN
⚠	0023105002		R101	RES CF 1/2W 1MJ
⚠	0910500511		NTC102	NTC R=5 OHM L 5A
⚠	2817202100		L101	LF 18mH MIN
⚠	1604315020		CX102	CAP X MM PC 275VAC .47UK
⚠	1101046027		CY102	CAP Y CD 250VAC 2.2KP MEI
⚠	1604206025		C126	CAP PP PC 275VAC .01UK
⚠	2310002001		IC201	PHOTO 70V 6PIN 100-300% VDE
⚠	2801002600		T101	X'FMR SMT L250 UHJ

SGS-THOMSON MICROELECTRONICS

TDA8172

TV VERTICAL DEFLECTION OUTPUT CIRCUIT

- POWER AMPLIFIER
- FLYBACK GENERATOR
- THERMAL PROTECTION



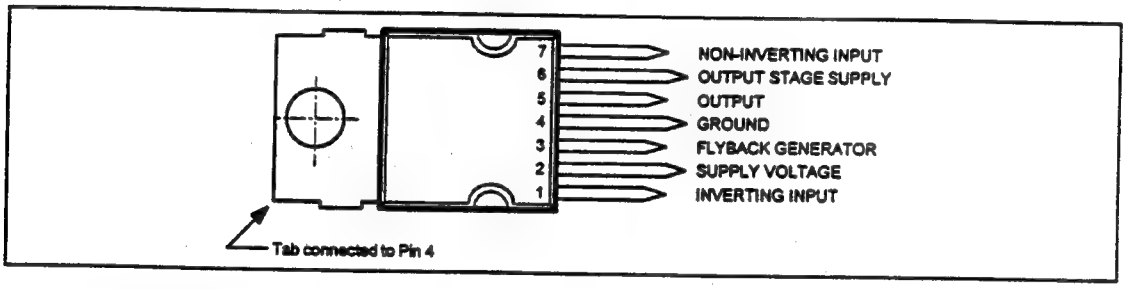
HEPTAWATT
(Plastic Package)

ORDER CODE : TDA8172

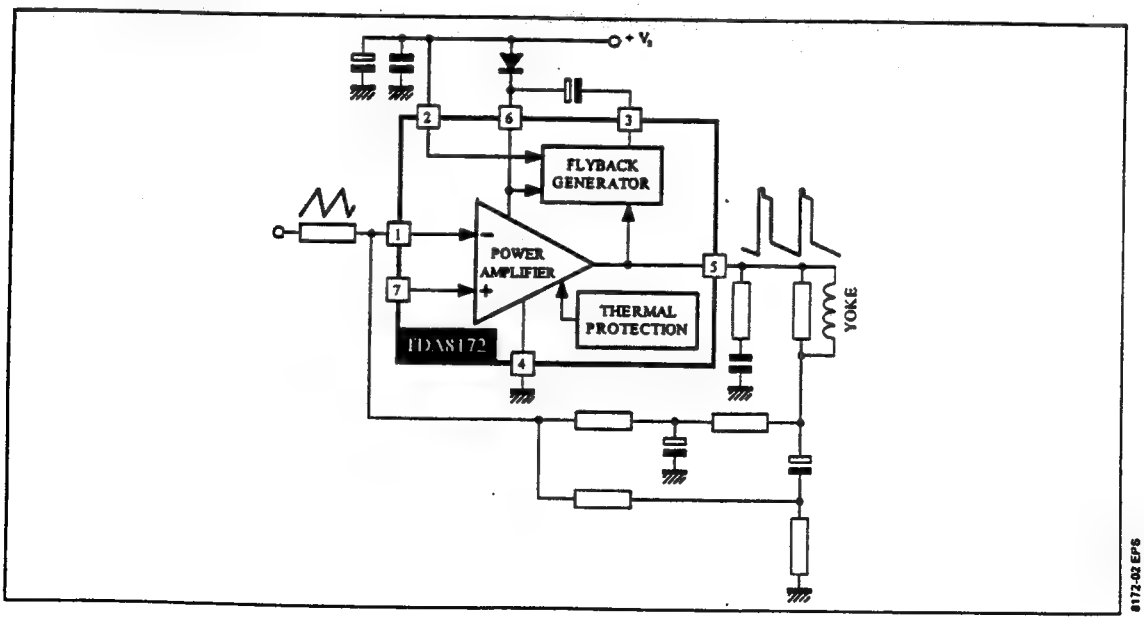
DESCRIPTION

The TDA8172 is a monolithic integrated circuit in HEPTAWATT™ package. It is a high efficiency power booster for direct driving of vertical windings of TV yokes. It is intended for use in Color and B & W television as well as in monitors and displays.

PIN CONNECTIONS (top view)



BLOCK DIAGRAM



MICROCHIP

24C08B/16B

8K/16K 5.0V E-Temperature Serial EEPROMs

FEATURES

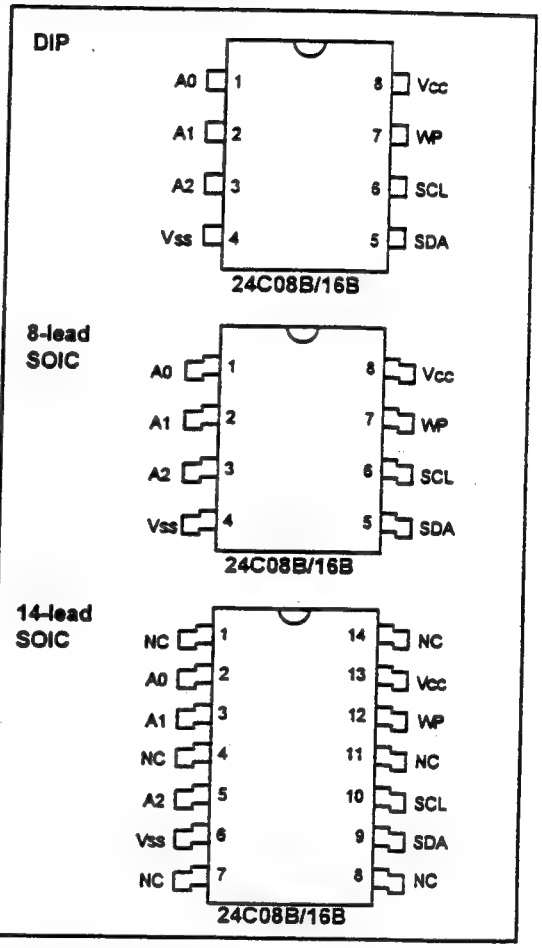
ingle supply with operation from 4.5-5.5V
ow power CMOS technology
- 1 mA active current typical
- 10 µA standby current typical at 5.5V

rganized as 4 or 8 blocks of 256 bytes (4 x 256 x 8) or (8 x 256 x 8)
wo wire serial interface bus, I²C™ compatible
chmitt trigger, filtered inputs for noise suppression
utput slope control to eliminate ground bounce
00 kHz compatibility
elf-timed write cycle (including auto-erase)
age-write buffer for up to 16 bytes
ms typical write cycle time for page-write
ardware write protect for entire memory
an be operated as a serial ROM
actory programming (QTP) available
SD protection > 4,000V
,000,000 ERASE/WRITE cycles guaranteed
ata retention > 200 years
pin DIP, 8-lead or 14-lead SOIC packages
vailable for extended temperature range
- Automotive: -40 C to +125 C

DESCRIPTION

The Microchip Technology Inc. 24C08B/16B is an 8K/16K bit Electrically Erasable PROM intended for use in extended/automotive temperature ranges. The device is organized as 4 or 8 blocks of 256 x 8 bit memory with a two wire serial interface. The 24C08B/16B also has a page-write capability for up to 16 bytes of data. The 24C08B/16B is available in the standard 8-pin DIP and both 8-lead and 14-lead surface mount SOIC packages.

PACKAGE TYPE



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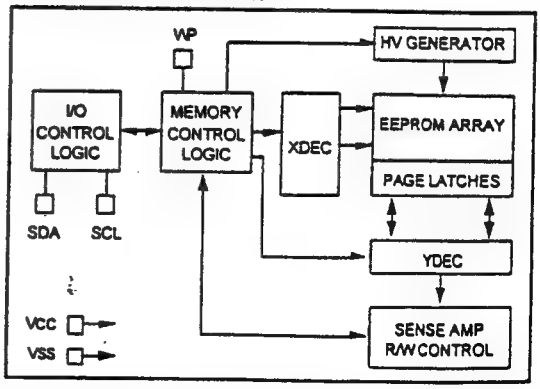


I²C is a trademark of Phillips Corporation.

1.0 ELECTRICAL CHARACTERISTICS

1.1 Maximum Ratings*

Vcc..... 7.0V

All inputs and outputs w.r.t. Vss .....-0.6V to Vcc +1.0V

Storage temperature .....-65 C to +150 C

Ambient temp. with power applied .....-65 C to +125 C

Soldering temperature of leads (10 seconds) ...+300 C

ESD protection on all pins .....≥ 4 kV

*Notice: Stresses above those listed under aximum ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operational listings of this specification is not implied. Exposure to maximum rating conditions for extended periods may affect device reliability.

TABLE 1-1: PIN FUNCTION TABLE

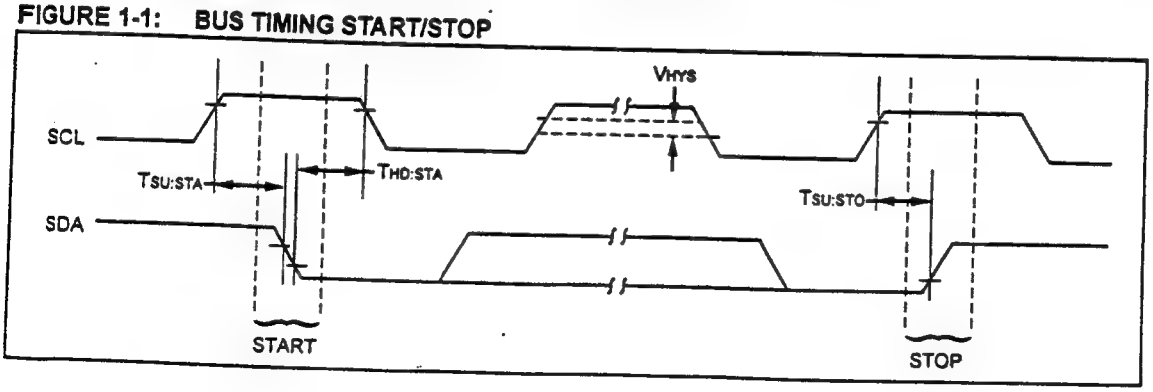
Name	Function
Vss	Ground
SDA	Serial Address/Data I/O
SCL	Serial Clock
WP	Write Protect Input
Vcc	+4.5V to 5.5V Power Supply
A0, A1, A2	No Internal Connection

TABLE 1-2: DC CHARACTERISTICS

		Vcc = +4.5V to +5.5V Automotive (E): Tamb = -40 C to +125 C			
Parameter	Symbol	Min	Max	Units	Conditions
WP, SCL and SDA pins:					
High level input voltage	VIH	.7 Vcc			
Low Level input voltage	VIL		3 Vcc	V	
Hysteresis of Schmitt trigger inputs	VHYS	.05 Vcc			Note 1
Low level output voltage	VOL		40	V	IOL = 3.0 mA, Vcc=4.5V
Input leakage current	ILI	-10	10	µA	VIN =.1V to Vcc
Output leakage current	ILO	-10	10	µA	VOUT = .1V to Vcc
Pin capacitance (all inputs/outputs)	CIN, COUT		0	pF	Vcc = 5.0V (Note 1) Tamb = 25 C, FCLK=1 MHz
Operating current	ICC write ICC read	— —	3 1	mA mA	Vcc = 5.5V, SCL = 400 kHz
Standby current	ICCS		00	µA	Vcc = 5.5V, SDA = SCL = Vcc

Note 1: This parameter is periodically sampled and not 100% tested.

FIGURE 1-1: BUS TIMING START/STOP



VP503

CRT Display Video Output Amplifier: High-Voltage, Wideband Amplification

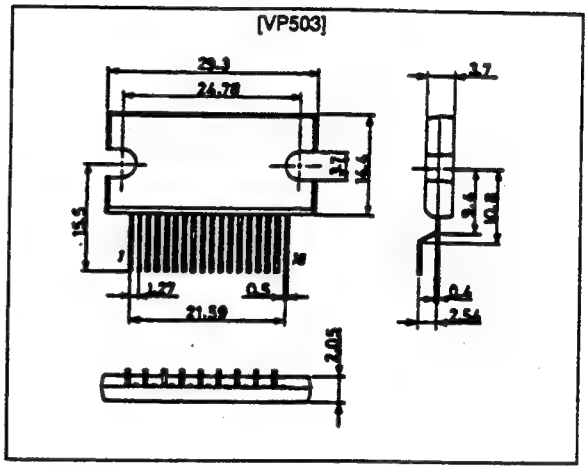
Function

- Three-channel video output circuit for CRT displays

Package Dimensions

unit: mm

2117



Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		90	V
	V_{EE} max		15	V
Allowable power dissipation	Pd max		4.5	W
		At Tc = 25°C with an ideal heat sink	25	W
Case temperature	Tc max		100	°C
Storage temperature	Tstg		−20 to +110	°C

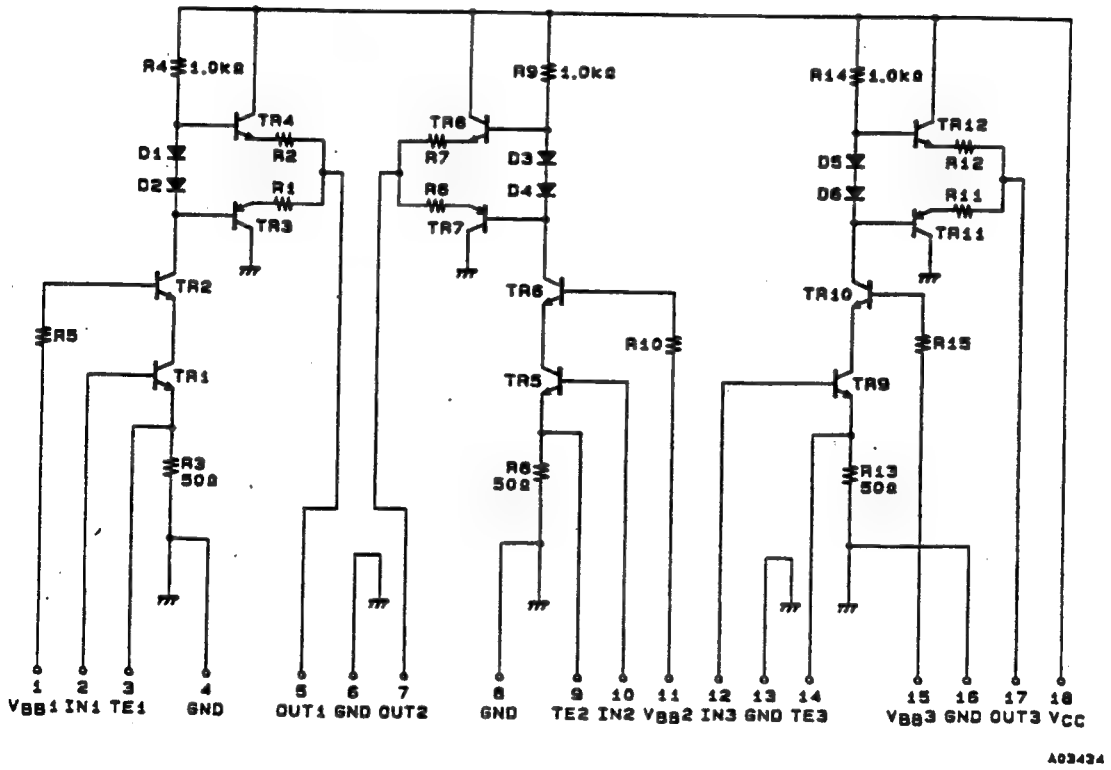
Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage I	V_{CC}		70	V
	V_{EE}		10	V
Recommended supply voltage II	V_{CC}		80	V
	V_{EE}		10	V

Electrical Characteristics at Ta = 25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Bandwidth I (–3 dB)	fc	V_{CC} = 70 V, V_{BB} = 10 V, C_L = 5 pF, V_{IN} (DC) = 2.3 V, V_{OUT} (p-p) = 40 V		. 80		MHz
Bandwidth II (–3 dB)	fc	V_{CC} = 80 V, V_{BB} = 10 V, C_L = 5 pF, V_{IN} (DC) = 2.5 V, V_{OUT} (p-p) = 50 V		75		MHz
Pulse response characteristics	tr	V_{CC} = 80 V, V_{BB} = 10 V, C_L = 5 pF, V_{IN} (DC) = 2.3 V, V_{OUT} (p-p) = 40 V		5.0		ns
	tf			5.0		ns
Voltage gain	G_V (DC)		17	19	21	
Current drain I	$I_{CC}1$	V_{CC} = 70 V, V_{BB} = 10 V, V_{IN} (DC) = 2.3 V, f = 10 MHz clock, C_L = 5 pF, V_{OUT} (p-p) = 40 V		40		mA
	$I_{CC}2$	V_{CC} = 70 V, V_{BB} = 10 V, V_{IN} (DC) = 2.3 V, f = 70 MHz clock, C_L = 5 pF, V_{OUT} (p-p) = 40 V		50		mA
Current drain II	$I_{CC}1$	V_{CC} = 80 V, V_{BB} = 10 V, V_{IN} (DC) = 2.5 V, f = 10 MHz clock, C_L = 5 pF, V_{OUT} (p-p) = 50 V		45		mA
	$I_{CC}2$	V_{CC} = 80 V, V_{BB} = 10 V, V_{IN} (DC) = 2.5 V, f = 70 MHz clock, C_L = 5 pF, V_{OUT} (p-p) = 50 V		60		mA

Internal Equivalent Circuit

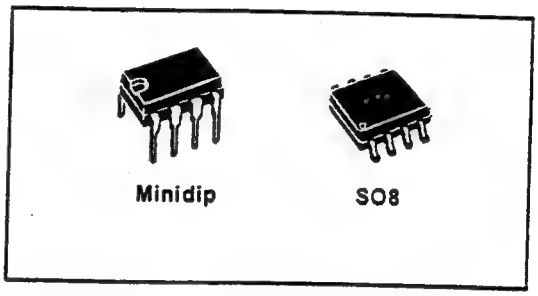


SGS-THOMSON MICROELECTRONICS

UC2842B/3B/4B/5B
UC3842B/3B/4B/5B

HIGH PERFORMANCE CURRENT MODE PWM CONTROLLER

- TRIMMED OSCILLATOR FOR PRECISE FREQUENCY CONTROL
- OSCILLATOR FREQUENCY GUARANTEED AT 250kHz
- CURRENT MODE OPERATION TO 500kHz
- AUTOMATIC FEED FORWARD COMPENSATION
- LATCHING PWM FOR CYCLE-BY-CYCLE CURRENT LIMITING
- INTERNALLY TRIMMED REFERENCE WITH UNDERVOLTAGE LOCKOUT
- HIGH CURRENT TOTEM POLE OUTPUT
- UNDERVOLTAGE LOCKOUT WITH HYSTERESIS
- LOW START-UP AND OPERATING CURRENT

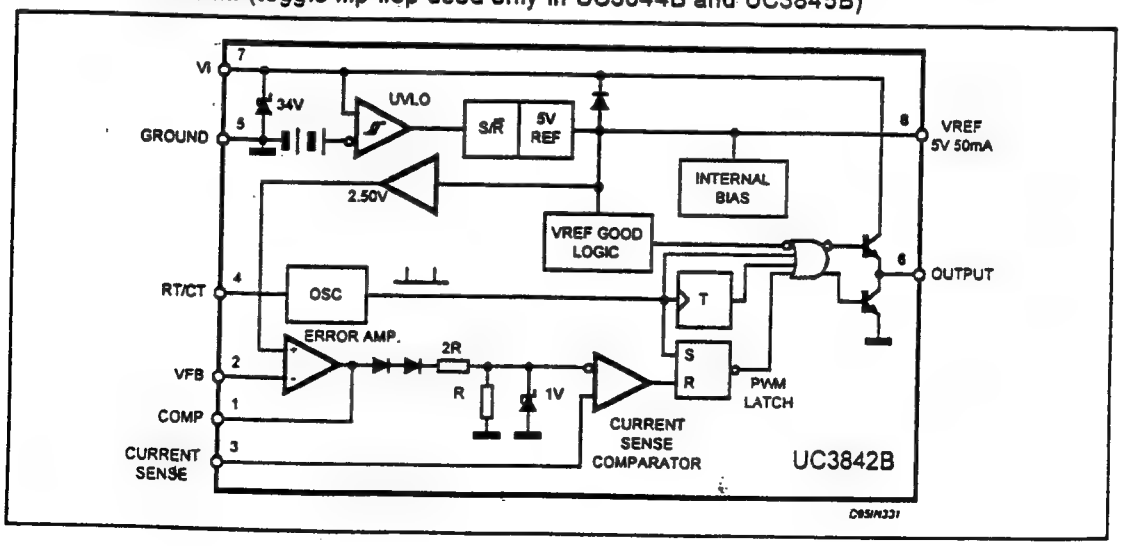


DESCRIPTION

The UC384xB family of control ICs provides the necessary features to implement off-line or DC to DC fixed frequency current mode control schemes with a minimal external parts count. Internally implemented circuits include a trimmed oscillator for precise DUTY CYCLE CONTROL under voltage lockout featuring start-up current less than 0.5mA, a precision reference trimmed for accuracy at the error amp input, logic to insure latched operation, a PWM comparator which also provides current limit control, and a totem pole output stage designed to source or sink high peak current. The output stage, suitable for driving N-Channel MOSFETs, is low in the off-state.

Differences between members of this family are the under-voltage lockout thresholds and maximum duty cycle ranges. The UC3842B and UC3844B have UVLO thresholds of 16V (on) and 10V (off), ideally suited off-line applications The corresponding thresholds for the UC3843B and UC3845B are 8.5 V and 7.9 V. The UC3842B and UC3843B can operate to duty cycles approaching 100%. A range of the zero to < 50 % is obtained by the UC3844B and UC3845B by the addition of an internal toggle flip flop which blanks the output off every other clock cycle.

BLOCK DIAGRAM (toggle flip flop used only in UC3844B and UC3845B)



SGS-THOMSON MICROELECTRONICS

TDA9106

LOW COST DEFLECTION PROCESSOR FOR MULTISYNC MONITORS

BRIEF DATA

HORIZONTAL

- SELF-ADAPTATIVE
- DUAL PLL CONCEPT
- 150kHz MAXIMUM FREQUENCY
- X-RAY PROTECTION INPUT
- I^2C CONTROLS : HORIZONTAL DUTY-CYCLE, H-POSITION, FREE RUNNING FREQUENCY, FREQUENCY GENERATOR FOR BURN-IN MODE

VERTICAL

- VERTICAL RAMP GENERATOR
- 50 TO 165Hz AGC LOOP
- GEOMETRY TRACKING WITH V-POS & AMP
- I^2C CONTROLS : V-AMP, V-POS, S-CORR, C-CORR

I^2C GEOMETRY CORRECTIONS

- VERTICAL PARABOLA GENERATOR (Pincushion, Keystone, Corner Correction, Top/bottom Corner Correction Balance)
- HORIZONTAL DYNAMIC PHASE (Side Pin Balance & Parallelogram)
- HORIZONTAL AND VERTICAL DYNAMIC FOCUS (Horizontal Focus Amplitude, Horizontal Focus Symmetry)

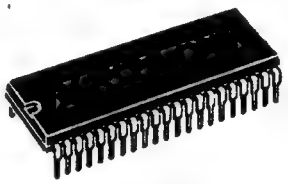
GENERAL

- SYNC PROCESSOR
- HOR. & VERT. SYNC OUTPUT FOR MCU
- HOR. & VERT. BLANKING OUTPUTS
- 12V SUPPLY VOLTAGE
- 8V REFERENCE VOLTAGE
- HOR. & VERT. LOCK UNLOCK OUTPUTS
- READ/WRITE I^2C INTERFACE
- HORIZONTAL MOIRE OR DAC OUTPUT

DESCRIPTION

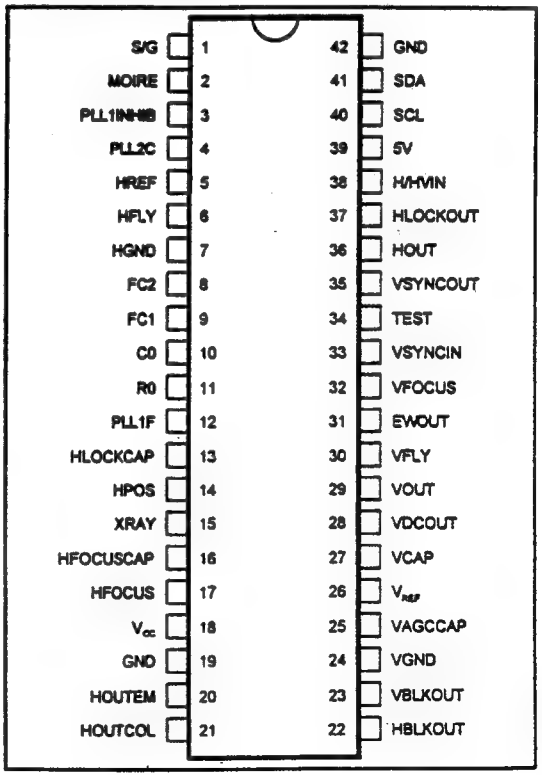
The TDA9106 is a monolithic integrated circuit assembled in 42 pins shrunk dual in line plastic package. This IC controls all the functions related to the horizontal and vertical deflection in multimodes or multi-frequency computer display monitors.
The internal sync processor, combined with the very powerful geometry correction block are making the TDA9106 suitable for very high performance monitors with very few external components.
It is particularly well suited for high-end 15 nd 17" monitors.

Combined with ST7275 Microcontroller family, TDA9206 (Video preamplifier) and STV942x (On-Screen Display controller) the TDA9106 allows to built fully I^2C bus controlled computer display monitors, thus reducing the number of external components to a minimum value.



SHRINK42
(Plastic Package)
ORDER CODE : TDA9106

PIN CONNECTIONS



PIN CONNECTIONS

Pin	Name	Function
1	S/G	Sync on green input
2	MOIRE	Moire output
3	PLL1 INHIB	TTL-Compatible input for PLL1 inhibition
4	PLL2C	Second PLL Loop Filter
5	HREF	Horizontal Section Reference Voltage (to filter)
6	HFLY	Horizontal Flyback Input (positive polarity)
7	HGND	Horizontal Section Ground
8	FC2	VCO Low Threshold filtering Capacitor
9	FC1	VCO High Threshold filtering Capacitor
10	C0	Horizontal Oscillator Capacitor
11	R0	Horizontal Oscillator Resistor
12	PLL1F	First PLL Loop Filter
13	HLOCKCAP	First PLL Lock/Unlock Time Constant Capacitor
14	HPOS	Horizontal Centering Output (to filter)
15	XRAY	X-RAY protection input (with internal latch function)
16	HFOCUSCAP	Horizontal Dynamic Focus Oscillator Capacitor
17	HFOCUS	Horizontal Dynamic Focus Output
18	V_{CC}	Supply Voltage (12V Typ)
19	GND	General Ground (related to V_{CC})
20	HOUTEM	Horizontal Drive Output (internal transistor emitter)
21	HOUTCOL	Horizontal Drive Output (int. trans. open collector)
22	HBLKOUT	Horizontal Blanking Output (see activation table)
23	VBLKOUT	Vertical Blanking Output (see activation table)
24	VGND	Vertical Section Ground
25	VAGCCAP	Memory Capacitor for Automatic Gain Control Loop in Vertical Ramp Generator
26	V_{REF}	Vertical Section Reference Voltage (to filter)
27	VCAP	Vertical Sawtooth Generator Capacitor
28	V_{DCOUT}	Vertical Position Reference Voltage Output
29	VOUT	Vertical Ramp Output (with frequency independant amplitude and S or C Corrections if any)
30	VFLY	Vertical Flyback Input (positive polarity)
31	EWOUT	East/West Pincushion Correction Parabola Output (with Corner corrections if any)
32	VFOCUS	Vertical Dynamic Focus Output
33	VSYNCIN	TTL-compatible Vertical Sync Input (for separated H&V)
34	TEST	Not to be used - Test pin
35	VSYNCOUT	TTL Vertical Sync Output (Extracted VSYNC in case of S/G or TTL Composite HV Inputs)
36	HOUT	TTL Horizontal Sync Output (To be used for frequency measurement)
37	HLOCKOUT	First PLL Lock/Unlock Output (5V unlocked - 0V locked)
38	H/HVIN	TTL-compatible Horizontal Sync Input
39	5V	Supply Voltage (5V Typ.)
40	SCL	I^2C-Clock input
41	SDA	I^2C-Data input
42	GND	Ground (Related to 5V)

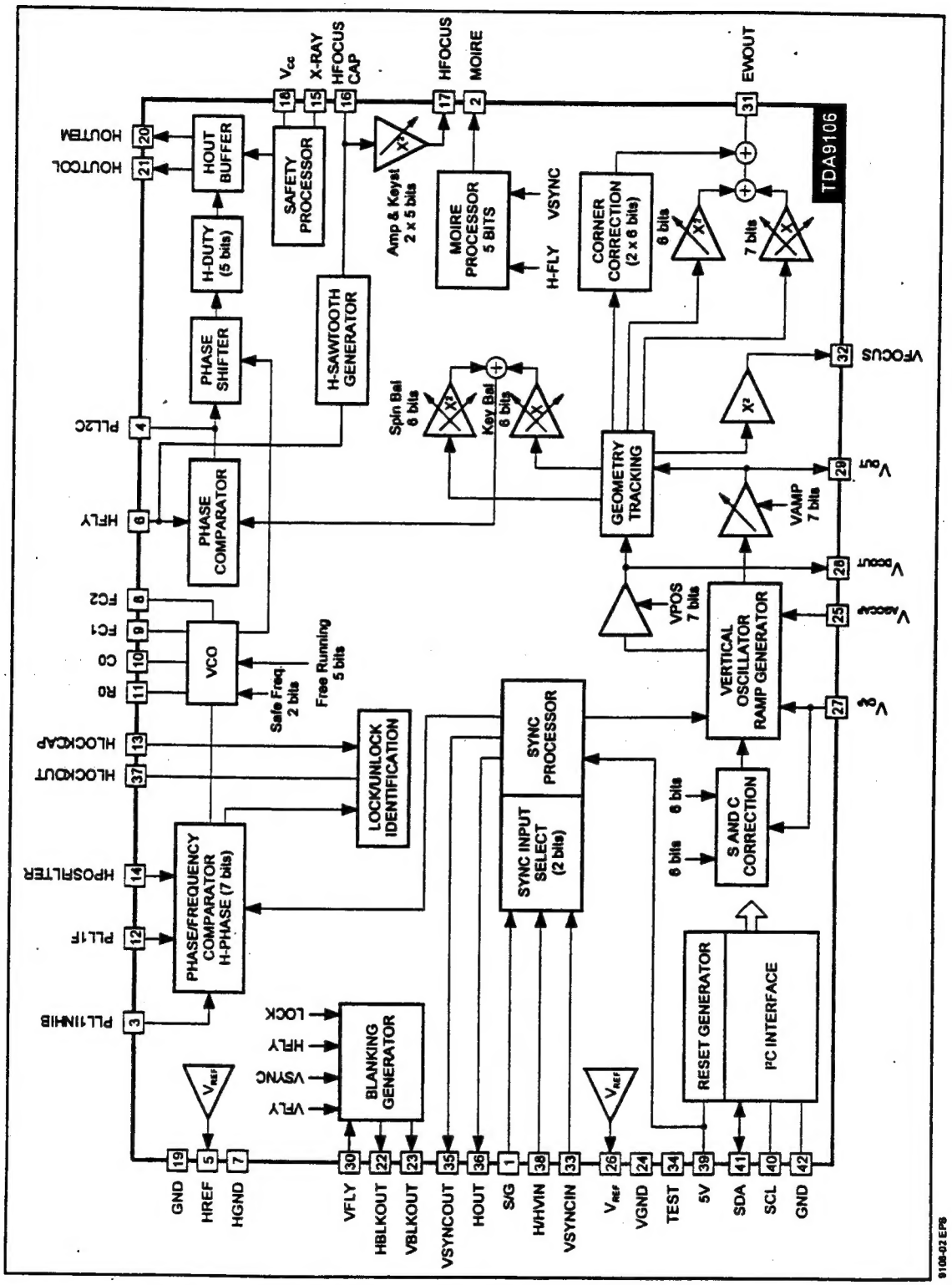
9106-01.TBL

QUICK REFERENCE DATA

Parameter	Value	Unit
Horizontal Frequency	15 to 150	kHz
Autosynch Frequency (for given R0 and C0)	1 to 4.5	FH
± Horizontal Sync Polarity Input	YES	
Polarity Detection (on both Horizontal and Vertical Sections)	YES	
TTL Composite Synch or Sync on Green	YES	
Lock/Unlock Identification (on both Horizontal 1st PLL and Vertical Section)	YES	
I^2C Control for H-Position	± 10	%
XRay Protection	YES	
I^2C Horizontal Duty Adjust	30 to 60	%
I^2C Free Running Adjustment	0.8 to 1.3	F0
Stand-by Function	YES	
Two Polarities H-Drive Outputs	YES	
Supply Voltage Monitoring	YES	
PLL1 Inhibition Possibility	YES	
Blanking Outputs (both Horizontal and Vertical)	YES	
Vertical Frequency	35 to 200	Hz
Vertical Autosync (for 150nF)	50 to 165	Hz
Vertical S-Correction	YES	
Vertical C-Correction	YES	
Vertical Amplitude Adjustment	YES	
Vertical Position Adjustment	YES	
East/West Parabola Output	YES	
Pin Cushion Correction Amplitude Adjustment	YES	
Keystone Adjustment	YES	
Corner and Corner Balance Adjustments	YES	
Internal Dynamic Horizontal Phase Control	YES	
Side Pin Balance Amplitude Adjustment	YES	
Parallelogram Adjustment	YES	
Tracking of Geometric Corrections	YES	
Reference Voltage (both on Horizontal and Vertical)	YES	
Dynamic Focus (both Horizontal and Vertical)	YES	
I^2C Horizontal Dynamic Focus Amplitude Adjustment	YES	
I^2C Horizontal Dynamic Focus Keystone Adjustment	YES	
Type of Input Sync Detection (supplied by 5V Digital Supply)	YES	
Horizontal Moir utput	YES	
I^2C Controlled H-Moir mplitude	YES	
Frequency Generator for Burn-in	YES	
Fast I^2C Read/Write	400	kHz

0103-02.TBL

BLOCK DIAGRAM



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